CITY OF ORILLIA

TO:	Council Committee
FROM:	Public Works Department
REPORT NO.:	PW-12-043
DATE:	July 6, 2012
SUBJECT:	Executive Summary – Public Consultation on Fluoridation Report

Recommendation

THAT Council receive this report and approve a resolution stating the following:

WHEREAS Council may by by-law establish, maintain, and operate a fluoridation system in connection with the City of Orillia's waterworks system, as authorized by the Fluoridation Act, and as regulated by the Ministry of the Environment;

WHEREAS at the Global Consultation on Oral Health Through Fluoride (2006), the World Health Organization, the World Dental Federation and the International Association for Dental Research reaffirmed the efficiency, cost-effectiveness, and safety of the daily use of optimal fluoride to prevent dental decay, and confirmed that universal access to fluoride for dental health is a part of the basic human right to health;

WHEREAS the U.S. Centers for Disease Control and Prevention declared fluoridation of drinking water to be one of the ten great public health achievements of the 20th century;

WHEREAS in June of 2011, Health Canada released the results of a multi-year, systematic review of the health risks associated with fluoride in drinking water and concluded that *"The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects…";*

WHEREAS the aforementioned Health Canada review also stated that *"… the optimal concentration of fluoride in drinking water for dental health has been determined to be 0.7 mg/L for communities who wish to fluoridate. This concentration provides optimal dental health benefits and is well below the MAC (Maximum Acceptable Concentration of 1.5 mg/L) to protect against adverse effect"*;

WHEREAS in its April 2009 position statement, the Board of Health for the Simcoe Muskoka District Health Unit concludes that "*optimally fluoridated drinking water should be available to all residents on municipally supplied drinking water systems."*

THEREFORE BE IT RESOLVED THAT the Corporation of the City of Orillia supports the fluoridation of the City of Orillia's drinking water.

THAT a capital budget of $180,000 be established for implementation of fluoridation funded from the Water and Wastewater Reserve.

AND THAT Council Committee consider this report at its July 2012 meeting and that a Council decision on any recommendation from Council Committee be deferred until the August 2012 Council meeting, to allow sufficient time to consider the information provided.

Background

As directed by Council, the Public Works Department has undertaken a public consultation process to consider fluoridation of City drinking water, with the assistance of the Simcoe Muskoka District Health Unit (SMDHU). A brief presentation was made by SMDHU to Council Committee at its meeting held on June 20, 2011. The SMDHU is the lead advisor to the City on public health issues and works closely with the City to ensure drinking water safety. The public consultation was carried out with the general objectives of being open, transparent, and respectful, raising awareness, and providing opportunities to hear and be heard on the subject of fluoridation. The process also sought to provide Council with unbiased and factual information, and to assist with answering some key policy questions.

Public Consultation Overview

Over the period of October 2011 to May 2012, public consultation included: two public forums and six community group presentations, as well as a media briefing, presentations to City staff, a presence on the City's website, and communication with local media and the public in general. Also, Orillia Citizens Against Fluoridation made a deputation to Council at its May 7, 2012 meeting. Correspondence has been primarily via email or letter, and local media have provided ongoing coverage of the issue. The City's consultation has drawn the attention of national and international anti-fluoridation groups and has prompted the start of a local group. While not large enough to be a representative sample of the population, a significant amount of the correspondence received has been from those opposed to fluoridation.

Background on Fluoride and Fluoridation

Fluorine is found abundantly in the earth's crust in the form of the fluoride ion. Small amounts of fluoride are present in all water sources. Orillia's drinking water naturally has a fluoride content of about 0.2 mg/L. Fluoridation consists of the controlled addition of fluoride ions to water with naturally low fluoride levels, thereby raising the fluoride content to an optimal level for the promotion of dental health. Health Canada has determined the optimal concentration to be 0.7 mg/L and the Maximum Acceptable Concentration to be 1.5 mg/L. Fluoridation has been practiced in Canada and the U.S.

since 1945 and is endorsed by a long list of national and international health organizations, as well as several local ones. In Ontario, the fluoridation decision is made at the municipal level, as authorized by the Fluoridation Act.

Since 1997, there have been 18 major systematic reviews and reports of water fluoridation and the effect of fluorides conducted in Europe, the United Kingdom, Ireland, Australia, the United States and Canada. The overall conclusions from these reviews and reports are:

- Water fluoridation is still effective against dental cavities even when other sources of fluoride, e.g. toothpastes, topical fluorides, are used.
- Water fluoridation benefits all residents served by community water supplies, regardless of their age, education or their social or economic status.
- Community water fluoridation is the most efficient method, in terms of overall costs and population coverage, for the prevention of dental decay in the population.
- Water fluoridation is safe. Credible scientific research finds no evidence of increased risk of cancer, bone disease, kidney disease, fluoride toxicity, thyroid suppression, neurotoxicity or birth defects.
- Dental fluorosis can occur with excessive consumption of fluoride. This occurs in the Canadian population very rarely in its severe form, which has been declining in frequency since 1996. Mild and moderate fluorosis consists of white striations (streaks) on the teeth that are only visible during professional dental examination. A review of the data from the literature reviews does not find an elevation of fluorosis of aesthetic concern at the concentrations for CWF of 0.7 mg/L recommended by Health Canada.

Fluoridation is practiced in many countries and provides an estimated 370 million people with optimally fluoridated drinking water worldwide. Water fluoridation is practiced in European countries including: the United Kingdom, the Irish Republic, Spain, Poland, and Serbia. In addition, Germany, Switzerland and France add fluoride to salt as an alternative. Fluoridated water is supplied to about 74% of the population in the U.S., 45% in Canada, and 70% in Ontario.

Oral Health in Orillia

Orillia's municipal water supply has never been fluoridated. Analysis of the data from dental screening of school-aged children conducted by the Simcoe Muskoka District Health Unit demonstrates that, in Simcoe Muskoka, children in communities with water fluoridation have fewer cavities than those in communities with non-fluoridated municipal water. Among the 10 largest communities in Simcoe Muskoka, elementary school children in Orillia have the most severely decayed teeth. This represents a 66% higher decay rate than elementary school children in fluoridated areas of Simcoe Muskoka.

In addition, severe dental decay is more prevalent in Orillia. There are significantly more children in Orillia with approximately half their teeth affected by decay compared to

fluoridated areas of Simcoe Muskoka, and the City of St. Thomas, a demographically similar community with fluoridated water.

Financial Impact

Hydrofluorosilicic Acid (HFSA) is the most commonly used fluoridation product in North America and it is the most suitable product for use in Orillia. Operating costs for fluoridation systems are estimated to be $25,000 per year. The capital cost estimate is $160,000 to $180,000 and includes equipment, installation and modifications to ensure worker safety.

The cost of providing CWF in Orillia is estimated to be less than $1 per person per year, based on the total operating and capital costs and assuming a 30 year life for the capital. This compares very favourably with the current spending for the Children in Need of Treatment (CINOT) and the Ontario Works Dental Programs. It is also much less than estimated costs to provide topical fluoride application through public health hygienists ($650,500 annually) or private dentists ($1.4 million annually).

Concerns Raised and Analysis – Health Concerns

Overall, Health Canada's review of the available science concludes "…the weight of evidence does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects including immunotoxicity, reproductive and/or developmental toxicity, genotoxicity, and/or neurotoxicity." It also concludes that the evidence does not support a link between exposure to fluoride in drinking water and cancer or intelligence quotient deficit. Below is a brief summary of evidence with respect to some specific health concerns – more detail is included in the full report:

- Thyroid function – The European Commission's Scientific Committee on Health and Environmental Risk (SCHER) report states: "Human studies do not suggest adverse thyroid effects at realistic human exposures to fluoride."

- Kidney function – Data is too limited to determine any negative health effects on kidney function or on those with kidney disease from the consumption of water with fluoride concentrations of those with CWF (0.7 mg/L).

- Skeletal Fluorosis – Based on Health Canada's review, skeletal fluorosis is not a risk from water that has adjusted fluoride levels, as very high levels of fluoride intake are required before skeletal fluorosis will develop.

- Dental fluorosis – Occurs during tooth development, from birth to about five years of age, if higher than optimal levels of fluoride are ingested. After the enamel is completely formed, dental fluorosis cannot occur. Health Canada states that very mild and mild dental fluorosis in Canada is not elevated, and that since 1996 there has been an "overall decreasing trend of dental fluorosis in Canada".

Concerns Raised and Analysis – Fluoride Exposure

The total intake of fluoride from all sources (water, beverages, food, air, and toothpaste) was estimated in the Health Canada review as a key consideration in the determination of their recommendations. The concentrations recommended for community water fluoridation were determined to result in fluoride consumption levels that are safe and effective in preventing cavities.

The Scientific Committee on Health and Environmental Risk (SCHER) found that no experimental data exists on the dermal absorption of fluoride from water, and suggests that because fluoride is an ion it is not expected to be absorbed through the skin when in a water solution with near neutral pH. SCHER also states that the inhalation of fluoride from showering or bathing is unlikely to contribute significantly to the body's intake of fluoride in the general population.

Health Canada advises that it is safe to prepare infant formula with optimally fluoridated drinking water. This maximizes the protective role of fluoride during the development of the permanent teeth while minimizing the risk of dental fluorosis.

Concerns Raised and Analysis – Ecological Considerations

Although all natural water sources contain fluoride ions, very high levels of fluoride can be harmful to the aquatic environment. Discharges from Orillia's wastewater treatment centre are regulated by the Ontario Ministry of the Environment's Provincial Water Quality Objectives, of which there is no objective for fluoride. Fluoride concentrations are not decreased significantly through the sewage treatment process; effluent levels are estimated to be 0.5 to 0.6 mg/L due to dilution factors. The 2011 report by the European Commission's Scientific Committee on Health and Environmental Risks (SCHER), concludes that fluoridation of drinking water "does not result in unacceptable risk to water organisms."

The Canadian Council of Ministers of the Environment (CCME) has established a non-regulatory Interim Guideline for total inorganic fluorides of 0.12 mg/L for the protection of freshwater life, which includes a safety factor of 100. British Columbia's Freshwater Aquatic Life Guideline for Fluoride was revised in Sept 2011 to be 0.4 mg/L, which also uses a safety factor of 100. BC's guideline also suggests hardness-based, site specific objectives. Using this approach for Lake Simcoe, results in a toxicity-based guidance value of 147 mg/L, and a protective value of 1.5 mg/L. Impacts to aquatic life are unlikely to occur until concentrations exceed 1 mg/L for extended periods of time. Fluoridated drinking water is well below this concentration and would not be expected to impact aquatic life.

Concerns Raised and Analysis – Ethical and Philosophical Considerations

In a recent report that examined the ethical implications of fluoridating community water systems, the Québec Public Health Ethics Committee concluded: "the benefits of

fluoridation outweigh its potential negative effects on health and the environment and that such benefits justify impinging on the freedom of choice of people who do not wish to have their water fluoridated." The committee found it legitimate, from an ethical perspective "to require fluoridation of drinking water in Québec municipalities with populations of 5,000 or more in order to reduce tooth decay, especially among children and the socioeconomically disadvantaged."

In this report, the Public Works Department has recommended the fluoridation of the City of Orillia's drinking water. This recommendation is based upon the recommendations of the World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Simcoe Muskoka District Health Unit, and on the understanding that these individuals and organizations are committed to making decisions and recommendations based upon current scientific evidence.

Concerns Raised and Analysis – Operational and Occupational Health and Safety

Hydrofluorosilicic acid (HFSA) is supplied in a concentrated form and, in this form, is a corrosive acid that must be handled with appropriate precautions. Material safety data sheets (MSDS) and worker education and training programs help to ensure worker safety. WSIB reports zero lost time injuries of municipal water systems workers related to fluoridation chemicals in the last five years.

HFSA certified for use in drinking water is not classified as hazardous waste in Canada, but is identified as a dangerous good under the Transportation of Dangerous Goods Regulations and has been classified as a Class 8 corrosive substance. In the rare event an accident occurs during transport of HFSA, there are trained, equipped and qualified agencies and services using established Hazmat procedures to isolate, control and clean-up any hazardous spills that may occur.

Today's equipment allows water treatment personnel to easily monitor and maintain the desired fluoride concentration. It is anticipated that Orillia's fluoridation feed systems would add fluoride prior to the entrance of the chlorine contact chamber and monitor fluoride levels near to the discharge from this chamber. Feeder output would be adjusted based on fluoride levels detected by the fluoride analyzer. Safeguards used to ensure that fluoride adjustment is within the recommended range may include:

- Continuous monitoring of fluoride levels before water enters the distribution system, using online fluoride analyzers.
- Electrical interlocking of fluoride feed pumps so that the fluoride feed system cannot operate unless water is being produced.
- Use of a day tank with systems that use bulk storage, so that only a limited supply of chemical is directly connected to the suction side of fluoride feed pumps.
- Periodic sampling of fluoride levels throughout the water distribution system.
- Use of weigh scales for day tanks or drums and regular monitoring of weights to provide a redundant check of the amount of fluoride being fed.

Concerns Raised and Analysis – Source and Purity of Fluoridation Additives

HFSA is produced from phosphorite rock for intended use as a drinking water fluoridation additive. It is primarily manufactured as a co-product along with phosphoric acid used in the production of fertilizer. HFSA is not a waste product of this process and there is no requirement for fertilizer companies to dispose of it. Approximately 65% of HFSA production is for water fluoridation; the remainder is used primarily in the manufacture of solar panels.

HFSA is the most common water fluoridation additive used and the two other additives are derived largely from it. The Ontario Ministry of the Environment requires that HFSA added to drinking water meet the NSF/ANSI Standard 60: Drinking Water Chemicals - Health Effects, which is even more stringent than the Standard for fluoride used to produce pharmaceuticals. The NSF 60 Standard requires that impurities be limited to levels that are ten times lower than the maximum level set by Health Canada. In a comprehensive review of test results compiled by NSF, levels of arsenic in one hundred percent of samples met this criterion when HFSA was added to drinking water at its maximum use level (i.e. to add 1.2 mg/L Fluoride ion). Orillia would add HFSA at less than half the maximum use level (i.e. to add 0.5 mg/L Fluoride ion).

A Certificate of Analysis would be required to be provided with each shipment of HFSA, and City staff will be required to review it to ensure that the product has been tested to meet the NSF 60 Standard. This is also the method of verification used for shipments of other water treatment additives: City staff do not perform independent sampling and testing of shipments.

Concerns Raised and Analysis – Legal Liability

Section 19 of the Safe Drinking Water Act includes Orillia's Municipal Councilors among those who could be charged with an offence if they fail to exercise their responsibilities toward the operation of the water system. Subsection (5) explicitly states that no person will be considered to have failed in their duties if they relied in good faith on a report of a person whose professional qualifications lend credibility to the report.

With respect to drinking-water fluoridation, the Director of Public Works, a Professional Engineer, has provided this report recommending that Council support the implementation of fluoridation of the City of Orillia's drinking water. This recommendation is based upon recommendations of the World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Simcoe Muskoka District Health Unit. These individuals and organizations have advised that not only does drinking-water fluoridation cause no harm, but that it provides significant oral health benefits.

The City's Engineers who oversee the water system do not anticipate any concerns with the design, implementation and monitoring of fluoridation systems for the City's water system that are safe and reliable, both for City staff and for the public in general.

While the legality of fluoridation has been raised in numerous cases in the U.S. and a few in Canada in the last sixty years, the courts have viewed fluoridation as a proper means of furthering public health and welfare.

Summary

Council will have to weigh the balance of pros and cons in making a decision on fluoridation. While the science available strongly supports fluoridation, the response of the citizens of Orillia to the practice must also be considered. Comprehensive reviews of all relevant studies have been completed by reputable health agencies around the world that conclude that the weight of evidence is in favour of fluoridation – it is safe, effective, and economical.

Public opinion on fluoridation in Orillia is divided. Approximately 85% of individuals submitting input during the public consultation process have been opposed. However, independent polling conducted as recently as 2011 indicated that 64% of randomly selected Orillians supported adding fluoride to public drinking water, with 25% opposed, and 11% undecided. Freedom of choice will be limited for individuals who are opposed if fluoridation proceeds.

Council will have to judge whether they are satisfied with the conclusions of our nation's health experts, and whether the public response is significant enough to warrant going against their advice.

The objectives of the public consultation process have been achieved in addition to answering some key policy questions. Staff are recommending that Council support the fluoridation of the City of Orillia's drinking water, and establish a capital budget for implementation.

Prepared and Recommended by:

_____	_____
Jason Covey, P. Eng.	Peter Dance, P. Eng.
Water/Wastewater Engineer	Director of Public Works

Enclosed:

- City of Orillia Public Consultation on Fluoridation Report, July 2012

City of Orillia

Public Consultation on Fluoridation Report

July 2012

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1. Introduction

The Public Works Department's report on its findings to date regarding fluoridation of City drinking water is presented below. This report has been prepared with the assistance of the Simcoe Muskoka District Health Unit (SMDHU), who is the lead advisor to the City on public health issues. The Health Unit is governed by a Board of Health that operates under Ontario's Health Protection and Promotion Act (HPPA). This Act provides the legislative mandate for boards of health. The guiding purpose of the HPPA is to: "...provide for the organization and delivery of public health programs and services, the prevention of the spread of disease and the promotion and protection of the health of the people of Ontario. (R.S.O. 1990, c. H.7, s.2). The City works with the Medical Officer of Health to ensure the safety of drinking water, and is compelled to do so under the Safe Drinking Water Act.

Correspondence received during the public consultation is included in *Appendix A*. Due to the amount of correspondence received and the number of issues raised, response to individual questions was not practical. Based on a review of the input received throughout the public consultation and further research, the issues were summarized and addressed in this report.

The City of London, Ontario recently reviewed its practice of water fluoridation. London's administration, along with the Middlesex-London Health Unit, presented a thorough report to its Council. Several portions of London's report were relevant to Orillia and have been used or adapted in this report where noted. The entire London report is included in *Appendix L* for reference.

2. Public Consultation Process Overview

2.1. Background And Objectives

At the meeting of Council held on March 9, 2009, the Public Works Department was requested to report on the cost of implementing a fluoridation program in the City's water system. This request was made further to the Simcoe Muskoka District Health Unit's (SMDHU) 2009 report *Focus on Health STATS – Oral Health in Simcoe and Muskoka.* In that report, the Health Unit (which has largely non-fluoridated communities within its jurisdiction) compared its rate of tooth decay in children 5 to 13 years of age against other health units across Ontario. The data showed that the children of Simcoe Muskoka had consistently higher rates of decay than those in the other health unit jurisdictions with higher percentages of the population receiving fluoridated municipal water.

Subsequently, Council directed staff, in conjunction with SMDHU, to develop a public consultation process on fluoridation (PW-09-036).

Preliminary meetings were held with the Health Unit in regards to the consultation in early 2009. However, due to the anticipated significant workload associated with the pandemic H1N1 and G8 Summit on the Health Unit, the recommendation to defer the consultation until 2011 (PW-09-082) was adopted by the Council on October 26, 2009.

With reference to a Council Committee report (PW-11-041) from the Public Works Department, Council adopted at its June 27, 2011 meeting that staff be authorized to proceed with public consultation in cooperation with the Simcoe Muskoka District Health Unit in 2011, regarding possible fluoridation of the City's drinking water. A brief presentation was also made by SMDHU to Council Committee at its meeting held on June 20, 2011.

Subsequently, Council approved the schedule and actions to conduct a public consultation process with the assistance of SMDHU, at its September 19, 2011 meeting (PW-11-058). The expressed goal of the public consultation process is to assist Council to make an informed decision about community water fluoridation in Orillia.

The objectives of the public consultation process are:

- To provide Council with unbiased and factual information about community water fluoridation.
- To raise the level of awareness about community water fluoridation among the citizens of Orillia.
- To provide an opportunity for citizens of Orillia to hear about and be heard about community water fluoridation.
- To achieve an open and transparent consultative process that will respect and address the views and concerns of the citizens of Orillia.

In addition, the public consultation was to assist in answering key policy questions such as:

- What is the potential health benefit for the Orillia community?
- What are any potential negative health impacts?
- What are the common public views, perceptions and concerns?
- What are the potential costs and benefits to the community?
- What is the overall degree of public support or opposition?

2.2. Recap Of Process

The public consultation has been carried out according to the following schedule of activities:

<u>October to December 2011</u>

A new section was created on the City's website devoted to fluoridation. This initially included details of the public consultation process, some basic information about fluoridation, and a link to the SMDHU's fluoridation page. Notice of important dates and events were also posted periodically.

SMDHU also began to engage local dentists and doctors to provide information about fluoridation to their patients.

<u>December 2011 to May 2012</u>

Information sessions were conducted with City staff from the Water Filtration Plant, Waste Water Treatment Centre, Municipal Operations Centre (Water and Sewer staff),

and Engineering (front desk staff). The public consultation process was reviewed and SMDHU gave a thorough presentation on the topic of fluoridation. Feedback from staff was obtained following the presentations and these comments, questions, and responses were recorded *(See Appendix B).*

Information sessions were also delivered to community groups where there was interest and opportunity to do so. Time for feedback was included at each session and comments, questions, and responses were recorded *(see Appendix C).* Sessions were delivered to the following groups: The Intelligent Elders Senior's Club of Orillia, Muskoka Simcoe Dental Society, Orillia Soldiers' Memorial Hospital Grand Rounds, Orillia Chapter Simcoe County Alliance to End Homelessness (SCATEH), Chamber of Commerce Board, and the Rotary Club of Orillia.

A media briefing was arranged on January 23, 2012 to provide information to local media and obtain initial feedback. A record of the feedback obtained during this session is also included in *Appendix C*.

Also during this time, the SMDHU further developed its community engagement strategy. This included producing an information kit for distribution to stakeholders beginning in January *(See copy of info kit in Appendix E).* In April the health unit undertook a paid advertising campaign (print and radio) to promote Oral Health Month. Key messages included how to prevent cavities, oral health services offered by the health unit, and the benefits of community water fluoridation *(see Appendix F).*

<u>February 29, 2012</u>

The first community open forum was held and included: information tables, formal presentations from ten individuals, and a time for questions and comments from the public. Various groups and individuals supporting and opposed to fluoridation took advantage of all three noted elements.

19 questions were received at this public forum on topics that included: Health Canada's Review of Fluoride in Drinking Water, effects on IQ, recent decisions on community water fluoridation in Canada, environmental concerns, transportation safety, source and purity of fluoridation additives, fluoride exposure, local public opinion on fluoridation, cost effectiveness, ethical considerations.

Appendix D contains materials from this forum and includes: copies of the presentations, a list of questions and comments received, and prepared responses.

<u>February to May 2012</u>

Preparation of the staff report including: evaluation of and research on public input, comments, and presentations received prior to the published deadline of March 30, 2012.

<u>May 7, 2012</u>

Although not in the original schedule, Canadians Opposed to Fluoridation presented a deputation to Council.

May 29, 2012

The second community open forum was held including a presentation of the draft staff report followed by a question and answer period. 32 questions and comments were received and responded to by a panel that included representatives from the Simcoe Muskoka District Health Unit, Health Canada, and the City. Questions included topics such as: the effectiveness of fluoridation, the public consultation and Council decision-making process, dental fluorosis, fluoride exposure, fluoridation additives, factors affecting oral health (i.e. nutrition, socio-economic factors), recent decisions on community water fluoridation in Canada, cost effectiveness, freedom of individual choice, fluoridation's effect on lead levels water, and potential health effects.

Materials from this forum are included in *Appendix M* including: a copy of the presentation slides, questions and comments received, and the responses given. Additional information was also promised for a few of the specific questions received; this information is also included in *Appendix M*.

June 13, 2012

Following a deputation from the Orillia Citizens Against Fluoride group at the meeting of the Waste Management Advisory Committee (WMAC) on May 23, 2012, the committee passed a motion recommending that the City's water not be fluoridated at its meeting on June 13, 2012.

2.3. Public Correspondence

Correspondence received prior to March 30th, 2012 is included in *Appendix A-1* and consisted of 271 emails, 16 letters, and 15 written comments submissions, and 4 petitions (opposed to fluoridation). Of the emails, 129 were automatically generated by a website that hosted one of the petitions, each simply requesting that Mayor and Council vote against fluoridating Orillia's water supply. Of the remaining emails, 55 were submitted by only five individuals. All correspondence was acknowledged with an initial response and any concerns further investigated as necessary.

The medical and dental community submitted several correspondence items to express their support for fluoridation in Orillia. These included: Orillia Soldiers' Memorial Hospital, the Chief Medical Officer of Health of Ontario, Association of Supervisors of Public Health Inspectors of Ontario, Muskoka-Simcoe Dental Society, Ontario Association of Public Health Dentistry, Community Health Nurses Initiatives Group, Canadian Dental Hygienists Association, as well as several local dentists and hygienists.

The majority of individuals who contacted the City were either from the City of Orillia or the surrounding area. However, about one third of the individuals were from outside the area: from other parts of Ontario, Canada, the U.S. and from across the world. This is

indicative of the controversial nature of the water fluoridation issue worldwide. In total, 191 individuals provided input prior to the March 30th deadline.

Approximately 85% of these individuals have indicated that they are opposed to fluoridation of the City's drinking water for a variety of reasons (12% in favour and 3% did not specify). The most common concerns raised were regarding potential negative health impacts (27% of the correspondence) and the source and purity of fluoridation additives (25% of the correspondence). Also, a significant amount of input was received (ranging between 8% and 16% of correspondence) that raised concerns regarding:

- possible fluoride over-exposure
- the effectiveness of fluoridation in improving dental health
- the individual's right to freedom of choice
- the advice of public health experts may be flawed
- potential adverse environmental impacts
- legal liability for staff and Council
- cost effectiveness

About one third of the correspondence did not raise a particular issue but simply stated their opposition to fluoridation.

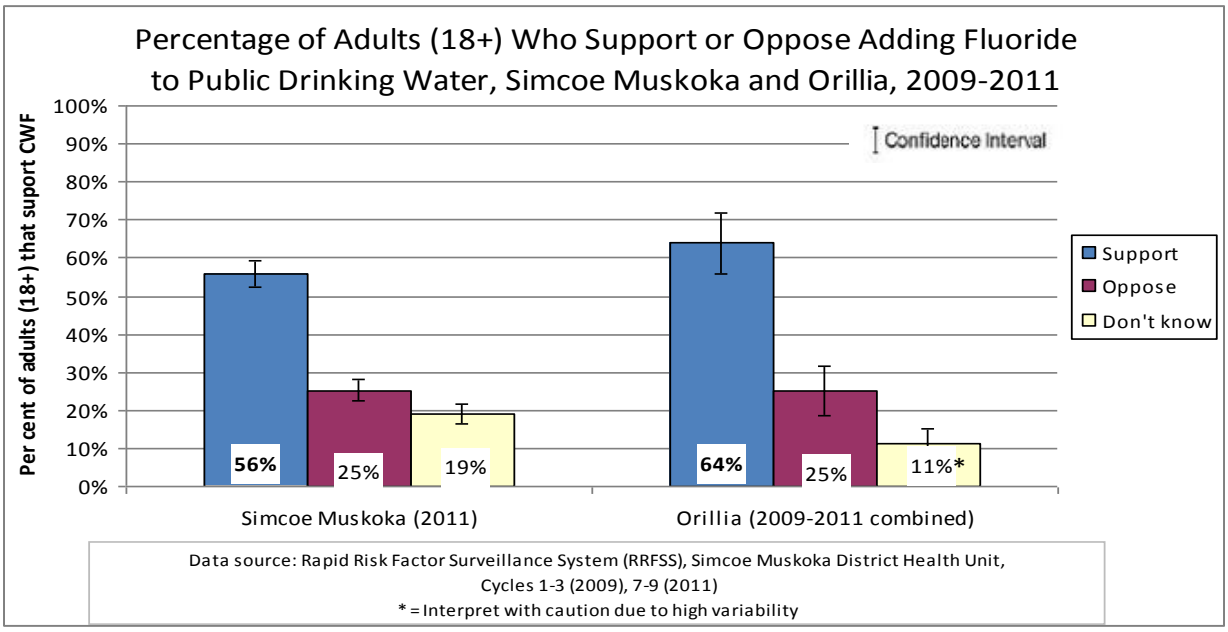
Further public input was invited following the second public forum and release of the draft report up until June 15th, 2012. 40 emails were received from 28 individuals and this correspondence is included in *Appendix A-3*. Approximately 86% of these individuals were opposed to fluoridation, with 7% in favour, and 7% did not specify.

Correspondence received between March 30th and May 29th, 2012 is also included in *Appendix A-2*.

3. Public Support For Fluoride In Orillia

According to the Rapid Risk Factor Surveillance System (RRFSS), a telephone survey of a random sample of 100 adults (aged 18 years and older) each month in Simcoe Muskoka regarding topics of importance to public health, 64% (95% confidence interval: 56%-71%) of randomly selected adults who reside in Orillia supported adding fluoride to public drinking water for the 2009 and 2011 cycles combined (Figure 1). Respondents were asked: *"Do you support or oppose adding fluoride to public drinking water when the natural amount is too low to help prevent tooth decay?"*

Figure 1: Support for Community Water Fluoridation in Simcoe Muskoka and Orillia Based on a Population-Based Survey.



RRFSS is conducted by a third party (the Institute for Social Research at York University) on behalf of health units and uses random digit dialing. Public opinion data on a province-wide scale is also included for reference, in *Appendix O* [2]. Telephone surveys are subject to non-response bias because not everyone has a phone. However, the number of people with a phone is higher and more representative than the number of people who read a local on-line newspaper, for example, so RRFSS is more valid than a survey conducted by the media of their audiences. The fact that telephone owners are randomly sampled minimizes the voluntary response bias.

References

1. Fawell J, Bailey K, Chilton E, Dahi E, Fewtrell L, Magara Y. (2006). "Fluoride in Drinking Water" World Health Organization. http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water_full.pdf
2. Rapid Risk Factor Surveillance System (RRFSS). Provincial Health Indicator Reports: Water Fluoridation. Ontario, Canada : Rapid Risk Factor Surveillance System; 2011 [online]. Accessed July 6, 2012 Available from: http://www.rrfss.ca/resources/Water%20Flouridation%20-%20RRFSS%20Provincial%20Health%20Indicator%20Report.pdf

4. Background

4.1. What Is Fluoride And Fluoridation?

Fluorine is an abundant element, found in the earth's crust in the form of the fluoride ion. As a gas, fluorine does not occur in its free state in nature, but exists only in combination with other elements as a fluoride compound. Fluoride compounds are components of minerals in rocks and soil. Water passes over rock formations and dissolves the fluoride compounds that are present, releasing fluoride ions. The result is that small amounts of fluoride are present in all water sources. A range of natural fluoride concentrations can be found in water across North America. The level of fluoride in water depends on the type of rocks and presence of minerals bearing fluoride. Most groundwater contains low concentrations (< 0.5 mg/L) of fluoride. High

levels of fluoride in groundwater are generally found in geological belts composed of either volcanic rock, granitic and gneissic rocks, or are in mountainous areas with marine sediments (i.e. Iraq, Iran, southern USA, southern Europe, East African Rift system).[1] Orillia's drinking water naturally has a fluoride content of about 0.2 mg/L.

Fluoridation consists of the controlled addition of fluoride ions to water with naturally low fluoride levels, thereby raising the fluoride content to an optimal level for the promotion of dental health. Health Canada has determined the optimal concentration of fluoride in drinking water for dental health to be 0.7 mg/L for communities who wish to fluoridate. This concentration provides optimal dental health benefits and is well below the Maximum Acceptable Concentration (1.5 mg/L) to protect against adverse effects.

References

1. Fawell J, Bailey K, Chilton E, Dahi E, Fewtrell L, Magara Y. (2006). "Fluoride in Drinking Water" World Health Organization. http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water_full.pdf

4.2. International / National History

In the early 1900s research was conducted by Dr. Frederick McKay, an American dentist, into the cause of a form of mottled teeth called "Colorado Brown Stain" (later recognized as severe fluorosis) which were also cavity-free. Research was continued by others in the 1930s and 40s, which focused on the relationships between fluoride concentration, fluorosis and tooth decay. It was established that 1 ppm (1mg/L) fluoride was associated with substantially fewer cavities and a mild increase in fluorosis that was of no medical or cosmetic concern. The first community water fluoridation program began in 1945 in Grand Rapids, Michigan, and the first Canadian city to begin fluoridation was Brantford, Ontario, later that same year.

Community Water Fluoridation in Canada began in 1945 with the Sarnia-Brantford-Stratford study. In an era where fluoride was not available by other means, the decay scores in optimally fluoridated Brantford decreased to match the scores in naturally fluoridated Stratford, while the scores in non-fluoridated Sarnia remained high over the 11 years of the study. Similarly, the percentage of cavity free children in Brantford rose from about 5.71% to 38.4% during the study period. The conclusion from this and other studies was that community water fluoridation is effective in reducing the severity and prevalence of tooth decay in children.[1]

By 1950 community water fluoridation was official policy of the United States Public Health Service, and by 1960 50 million Americans had access to fluoridated water. Between 1971 and 1991 the prevalence of any dental caries among children aged 12 to 17 years declined from 90.4% to 67%; severity declined from 6.2 decayed / missing / filled teeth to 2.8 per child.[2]

As of 2010, approximately 66% of Americans have access to fluoridated drinking water. As of 2007, approximately 45% of Canadians have access to fluoridated drinking water, as do approximately 76% of Ontarians.

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4.3. Opposition To Water Fluoridation

Opposition to community water fluoridation has existed since it was first implemented in the 1950s. Those opposed to fluoridation present several different arguments that range from concerns over the negative health effects of fluoride to the harm it does to the environment.

The 1950s and early 1960s were generally thought of as high points of scientific optimism and faith in experts. But in reality there was a growing anxiety about medical and scientific progress and expert opinion. People were frightened of nuclear fallout, DDT and other pesticides. There was growing anxiety that medical professionals and scientific research might be influenced by large corporations. There was a growing interest in alternative medicine. Under these circumstances, CWF became a flashpoint as cities across the U.S. and Canada debated whether or not to fluoridate their water.

By the late 1960s and early 1970s a mistrust of medical experts and the government became more pronounced. Those opposed to fluoridation put forth arguments that appealed to those on both the right (e.g. individual rights) and the left (e.g. environmentalists) of the political spectrum. The main arguments against water fluoridation included:

- Health allegations: That fluoride accumulates in the body; people are allergic; it causes cancer, heart disease, kidney disease, damages intelligence, skeletal fluorosis; environmental toxicity, etc.
- Industrial allegations: It's a *"toxic hazardous waste product of the aluminum industry";* it's a means for the aluminum industry to get rid of toxic waste which is costly to dispose of properly. Some suggested fluoridation was a Communist plot.
- Environmental concerns: fluoride is a toxic pollutant and is dangerous to aquatic life.
- Civil libertarian issues: a conflict between individual rights and the common good; forced "medication" without consent (legal challenges raised).
- Mistrust of government and scientists: decisions by "elitist" groups (health professionals, government, scientists) are based on the interests of large corporations and therefore cannot be trusted.
- Doubts about effectiveness: study results about effectiveness of fluoride to prevent dental decay are questionable.

Many of the arguments outlined above continue to be raised today by those opposed to fluoride, despite the large number of studies done over 65 years that provide evidence of the effectiveness of CWF as a preventative measure for tooth decay, and that discount the claims made in many of these arguments.

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4.4. Orillia History

Council originally passed a by-law to authorize the town to go ahead with fluoridation in June of 1966. Fluoridation had not commenced and, further to a citizen petition, the decision to fluoridate was overturned by a plebiscite in December of the same year, during municipal elections. Fluoridation was again discussed in the 1980s but was not pursued. In 2009, the Simcoe Muskoka District Health Unit's report on the state of Oral Health caught Council's attention and a public consultation was approved. This decision was reaffirmed by the new Council in June of 2011.

4.5. National And International Organizations That Support Fluoridation

Community Water Fluoridation is supported by a growing list of more than 125 North American and international organizations that recognize its public health benefits for preventing dental decay (See Appendix G). This list includes:

Canadian Association of Public Health Dentistry
Canadian Cancer Society
Canadian Dental Association
Canadian Paediatric Society
Canadian Public Health Association
Health Canada
American Cancer Society
FDI World Dental Federation
Pan American Health Organization
U.S. Public Health Service
U.S. Centers for Disease Control and Prevention (CDC)
World Health Organization

4.6. Local And Provincial Health Organizations That Support Fluoridation

Simcoe Muskoka District Health Unit Board of Health
Leadership Council of the North Simcoe Muskoka Local Health Integration Network
Muskoka Simcoe Dental Society
Board of Directors, Orillia Soldiers' Memorial Hospital
Department of Family Medicine, Orillia Soldiers' Memorial Hospital
Department of Paediatric and Neonatal Medicine, Orillia Soldiers' Memorial Hospital
Medical Advisory Committee, Orillia Soldiers' Memorial Hospital
Diabetes Education Centre, Orillia Soldiers' Memorial Hospital
Georgian College Dental Health Programs Faculty and Staff
Ontario Association of Public Health Dentistry
Royal College of Dental Surgeons of Ontario

Chief Medical Officer of Health of Ontario
Ontario Medical Association
Association of Local Public Health Agencies (alPHa)
Ontario Dental Association
Ontario College of Dental Hygienists

4.7. Organizations Opposed To Fluoridation

Organizations opposed to fluoride include the following:

Orillia Citizens Against Fluoridation
Canadians Opposed to Fluoridation
Fluoride Action Network
Canadian Association of Physicians for the Environment
Council of Canadians
International Academy of Oral Medicine & Toxicology
Great Lakes United
Keepers of the Well

4.8. Fluoridation Act

In Ontario, the responsibility of fluoridation of drinking water supplies is a decision that is made by each municipality, as authorized by the Fluoridation Act. Under the Act, Council may by by-law establish, maintain, and operate a fluoridation system in connection with the waterworks system. Council also has the option to put the question to the electorate prior to passing the by-law, but are not required to do so, under the Act.

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5. Overview Of Fluoridation And Its Benefits

Community water fluoridation (CWF) is proven as a safe and effective method of preventing tooth decay for the entire population. It has been studied for more than 60 years and an abundance of research exists that provides evidence as to its benefits.[1-23] CWF is recognized as one of the 10 great public health achievements of all time[24]

CWF benefits all residents regardless of their age, education, social or economic status, or ability to access regular dental care. People living in areas with CWF have rates of tooth decay that are 20 to 40 per cent lower than those who do not have this benefit.[2] CWF is especially beneficial to children. Based on 35 original studies, communities that fluoridate their water show a 14.3% to 15.5% increase in children free of dental decay, and a reduction of 2.61 decayed/missing filled teeth per child.[14] The cavity reduction benefits of CWF go beyond other good oral health behaviours, such as brushing with fluoridated toothpaste and regular dental care (including topical application of fluoride), and getting proper nutrition.

Many countries around the world - including some in North and South America, Australia, Asia and Europe - have access to optimally fluoridated drinking water through the addition of fluoride to the water system. This represents an estimated 370 million people who have access to optimally fluoridated drinking water. In addition, an estimated 50 million people live in communities throughout the world that have naturally fluoridated drinking water at sufficient concentrations to prevent cavities.[25] In the United States, almost three-quarters of U.S. residents receive fluoridated water through community water systems, or about 204 million residents. This represents a nine per cent increase (from 65% to 73.9%) between 2000 and 2010 of the U.S. population who are receiving fluoridated water through public water supplies.[26]

In Canada, about 45 per cent of the population has access to fluoridated drinking water. In Ontario, 70 per cent of the population lives in communities with CWF.[27] The first community in Ontario to add fluoride to its community water supply was Brantford in 1945. Many communities followed suit in the 1950s and 1960s.[1] Since that time, several communities that have implemented CWF have faced challenges to stop this practice. Some communities have discontinued CWF while others have chosen to maintain or to reintroduce it (with the resumption of CWF taking place as recently as 2012 in Trois Rivieres, PQ). (Table 1) In addition, three communities in Muskoka have recently begun to fluoridate subsequent to the District of Muskoka assuming operation of their water systems: Gravenhurst in 2003, and Baysville and MacTier in 2008.

Table 1: Status of Recent Challenges to Fluoridation in Canada

Ontario Municipalities Maintaining CWF	
London	Council voted to maintain CWF May 1, 2012
Halton Region	Council voted to maintain CWF January 12, 2012
Peel Region	Council voted to maintain CWF April 28, 2011
Hamilton	Board of Health voted to maintain CWF April 26, 2011
Muskoka District	Council voted to maintain CWF April 26, 2011
Toronto	Board of Health voted to maintain CWF April 4, 2011
Tottenham	Council voted to maintain CWF April 27, 2009
Norfolk County	Council voted to maintain CWF March 24, 2009
Atikokan	Council voted to maintain CWF Nov. 10, 2008
Ontario Municipalities that Ceased or Did Not Start CWF	
Amherstburg	Council voted to stop CWF February 7, 2012
Lakeshore	Council voted to stop CWF October 31, 2011
City of Waterloo	Referendum difference of 195 votes out of 30,727 cast, to stop CWF Oct 25, 2010. Council voted not to restart CWF November 29, 2010
Thunder Bay	Council voted not to start CWF July 20, 2009

Dryden	CWF defeated in referendum April 14, 2008
Niagara Region	Council voted not to restart CWF February 25, 2008
Canadian Municipalities Maintaining or Resuming CWF	
Trois Rivieres, PQ	Voted to resume CWF February 21, 2012
Fort St. John, BC	Voted 1,510 to 1,102 to maintain CWF November 19, 2011
Hinton, AB	Voted to maintain CWF November 15, 2011
Mont Joli, PQ	Voted to resume CWF November 2011
Whitecourt, AB	Voted to maintain CWF October 18, 2011
Churchill, MB	Continues to fluoridate after plebiscite October 19, 2011 voted 92 to 67 (28% electorate) against CWF
CBRM - NS	Voted to maintain CWF April 19, 2011
Lethbridge, AB	Voted to maintain CWF April 18, 2011
Dorval, PQ	Resumed CWF August 21, 2008 Community water fluoridation in Dorval, QC, was discontinued in 2003. In the 2-year period that followed, the percentage of kindergarten children at high risk of developing dental cavities doubled: rising from 8% to 17%.[28] In 2008, drinking-water fluoridation was re-introduced in Dorval.
Canadian Municipalities that Ceased CWF	
Moncton, NB	December 19, 2011
Dieppe, NB	December 12, 2011
Lake Cowichan, BC	November 19, 2011
Williams Lake, BC	November 19, 2011
Slave Lake, AB	September 12, 2011
Taber, AB	July 20, 2011
Meadow Lake, SK	July 4, 2011
Flin Flon, MB	July 2011
Grimshaw, AB	April 13, 2011
Calgary, AB	February 8, 2011
Vercheres, PQ	February 7, 2011

In each of the decisions above, different local factors applied in each municipality; but in each case local, provincial and federal public health agencies expressed their support for drinking water fluoridation.[29]

In a recent report that examined the ethical implications of fluoridating community water systems in the province of Quebec, the Comite d'ethique de sante publique (The Public Health Ethics Committee) concluded "the benefits of fluoridation outweigh its potential negative effects on health and the environment and that such benefits justify impinging on the freedom of choice of people who do not wish to have their water fluoridated." The committee found it legitimate, from an ethical perspective "to require fluoridation of drinking water in Québec municipalities with populations of 5,000 or more in order to reduce tooth decay, especially among children and the socioeconomically disadvantaged."[30]

In Canada, fluoride levels are carefully regulated and monitored by municipal, provincial and national governments. Health Canada's Expert Panel on water fluoridation (2007) recommended the optimal concentration for fluoride in drinking water to be 0.7 mg/L. At this level, people derive the benefit of fluoride to prevent dental cavities but are not exposed to levels that could cause adverse health effects.[6]

Some countries do not fluoridate their water but choose to provide fluoride to their citizens in other ways. For instance, Germany, Switzerland and France add fluoride to salt as an alternative to CWF.[31] Many European countries, whether or not their water or salt is fluoridated, provide their residents with some level of public insurance for dental care. These countries include Italy, Netherlands, Iceland, Sweden, Finland, France, Germany and the United Kingdom.[31] It should be noted that a number of the communities in these countries have naturally occurring fluoride in their public water system at concentrations sufficient to reduce cavities. There are also some countries in Europe that do have some communities with CWF, including: the United Kingdom, the Irish Republic, Spain, Poland, and Serbia.[25]

Drinking fluoridated water is not the only means through which fluoride can be ingested. Fluoride occurs naturally in some other foods and beverages, such as certain vegetables, meat, fish, milk and tea.[14] Foods that are processed in fluoridated water also serve as an additional source of fluoride.

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6. Scientific Reviews On Fluoridation

Research on community water fluoridation is extensive. Researchers in many different countries have published their findings in recognized peer-reviewed professional journals. Systematic reviews of this research confirm the safety and effectiveness of adding fluoride to drinking water to optimal levels in order to improve dental health.

Since 1997, there have been 18 major systematic reviews and reports of water fluoridation and the effect of fluorides conducted in Europe,[1,2] the United Kingdom,[3,4] Ireland,[5] Australia,[6-8] the United States[9-13] and Canada[14,15]. In Canada most recently, the Institut National de Santé Publique du Québec[16] (National Public Health Institute of Quebec) released its report, "Water fluoridation: An analysis of the health benefits and risks." As well, in 2007 Health Canada released the "Findings and Recommendations of the Fluoride Expert Panel,"[17] as did the Government of Canada with the "Joint Government Response to Environmental Petition Number 221: Petition to Discontinue Water Fluoridation" in 2008.[18] (See *Appendix H* for key conclusions of five of these reviews.)

The overall conclusions from these reviews and reports are:

- Water fluoridation is still effective against dental cavities even when other sources of fluoride (e.g. toothpastes, topical fluorides) are used.
- Water fluoridation benefits all residents served by community water supplies, regardless of their age, education or their social or economic status.
- Community water fluoridation is the most efficient method, in terms of overall costs and population coverage, for the prevention of dental decay in the population.
- Water fluoridation is safe. Credible scientific research finds no evidence of increased risk of cancer, bone disease, kidney disease, fluoride toxicity, thyroid suppression, neurotoxicity or birth defects.
- Dental fluorosis can occur with excessive consumption of fluoride. This occurs in the Canadian population very rarely in its severe form, which has been declining in frequency since 1996.[17] Mild and moderate fluorosis consists of white striations (streaks) on the teeth that are only visible during professional dental examination. A review of the data from the literature reviews does not find an elevation of fluorosis of aesthetic concern at the concentrations for CWF of 0.7 mg/L recommended by Health Canada. [19]

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7. Oral Health In Orillia

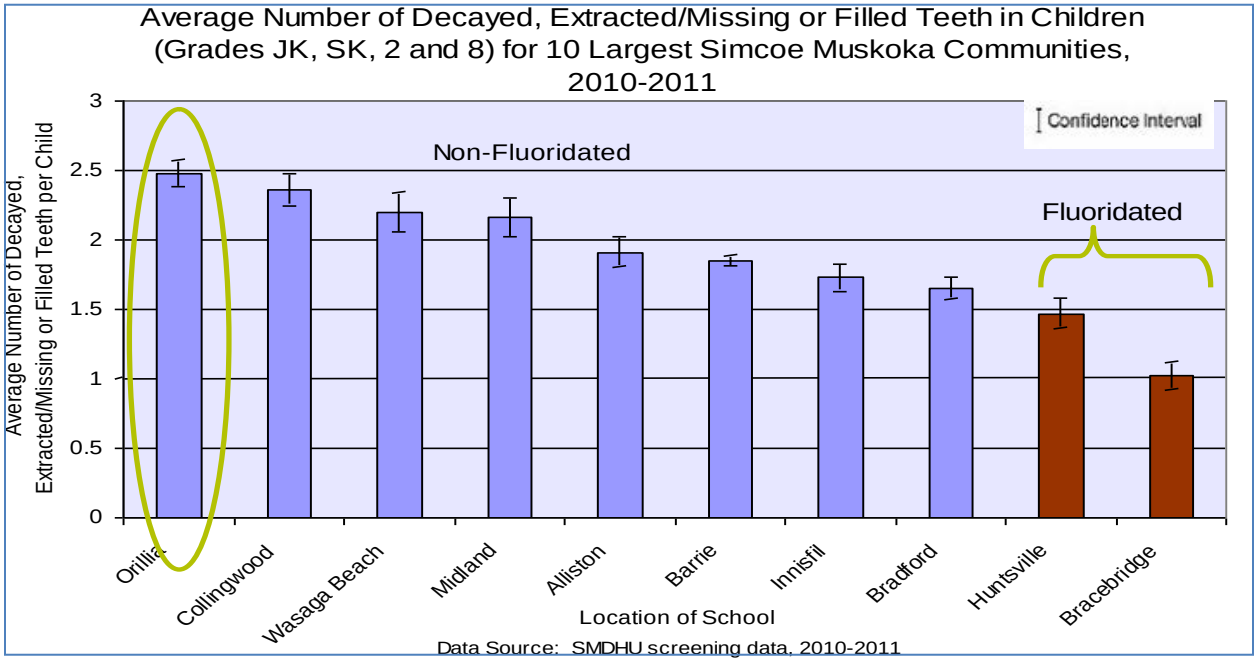
7.1. Dental Health Statistics For Elementary School-Aged Children In Orillia

Dental cavities are one of the most prevalent chronic diseases in childhood. A recent study showed there are more hospital emergency department visits in Ontario for non-traumatic dental problems than for diabetes and hypertensive diseases combined (Community Dentistry and Oral Epidemiology, August 2009). This is also true for Orillia Soldiers' Memorial Hospital (National Ambulatory Care Reporting System 2005-2009). Tooth decay can lead to many other issues such as difficulty with eating, increased pain, trouble concentrating, absence from work or school, and decreased self-esteem and social interaction.

Orillia's municipal water supply has never been fluoridated. Analysis of the data from dental screening of school-aged children conducted by the Simcoe Muskoka District Health Unit demonstrates that in Simcoe Muskoka, children in communities with water fluoridation have fewer cavities than those in communities with non-fluoridated municipal water. Among the 10 largest communities in Simcoe Muskoka, elementary school children in Orillia have the most severely decayed teeth (Figure 2).

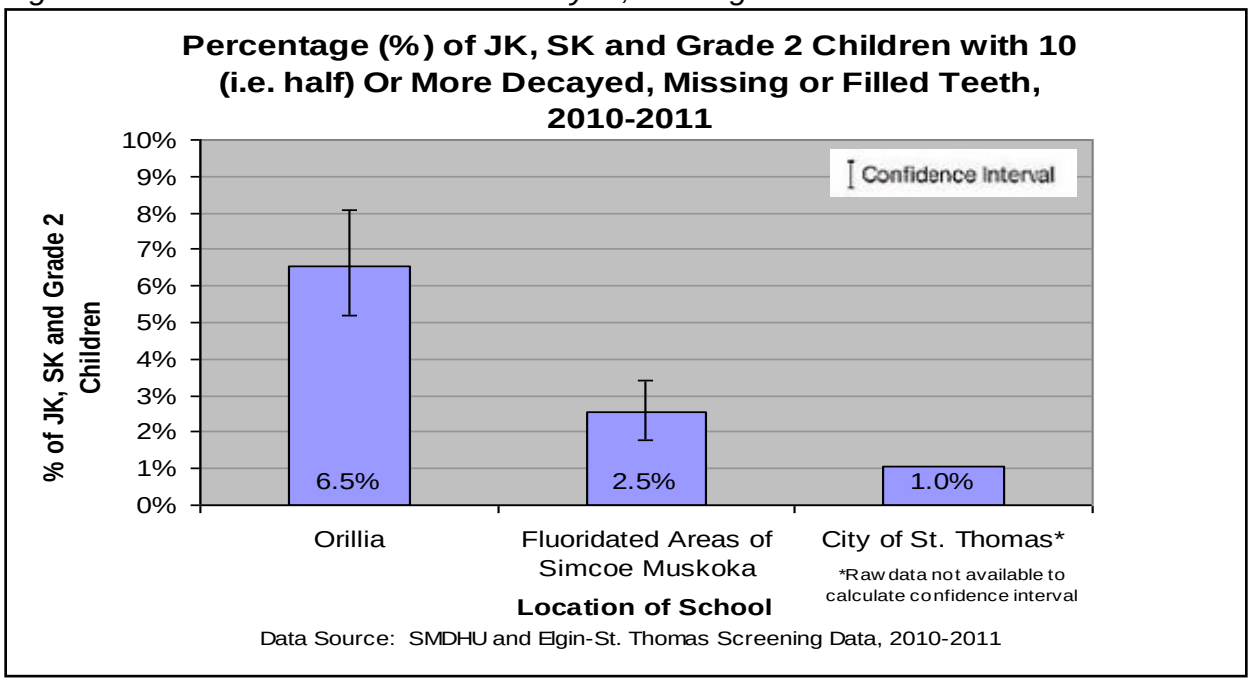
This represents a 66% higher decay rate than elementary school children in fluoridated areas of Simcoe Muskoka (SMDHU screening data, 2010-2011).

Figure 2: Average Number of Decayed, Extracted/Missing of Filled Teeth in Children in Simcoe Muskoka Communities



When comparing the percentage of children with 10 or more (i.e. half of their teeth or more) decayed, missing or filled, there are significantly more in Orillia compared to fluoridated areas of Simcoe Muskoka and the City of St. Thomas, which can be considered a fluoridated comparator community to Orillia (Figure 3).

Figure 3: Children with 10 or More Decayed, Missing or Filled Teeth



Thus fluoridation has the potential to be particularly effective in preventing severe dental decay in children in Orillia.

7.2. Dental Fluorosis Statistics For Elementary School-Aged Children In Orillia

As a result of a national clinical survey called the Canadian Health Measures Survey (2007-2009), Health Canada states that "so few children have moderate or severe fluorosis that, even combined, the prevalence is too low to permit reporting. This finding provides validation that dental fluorosis remains an issue of low concern in this country."[1]

The Ontario Public Health Standards Oral Health Assessment and Surveillance Protocol (2008) does not require the collection of fluorosis data, therefore it is not routinely collected in the Simcoe Muskoka District Health Unit (SMDHU) oral health screening program. The most recent year for which there are local fluorosis data is 2007-08 when the SMDHU collected comprehensive oral health data on approximately 1850 seven-year-olds across Simcoe Muskoka as part of a research project.

In this representative research sample, 180 seven-year-old children with a residential postal code starting with L3V (i.e. Orillia) were included. Amongst these 180 Orillia children, 118 of them had the adult teeth required to assess fluorosis (i.e. their right and left central incisors or right and left lateral incisors). The fluorosis data for these children are below (Table 3). The data for the fluoridated and non-fluoridated areas of Simcoe Muskoka are also included to show that there were no significant differences in the fluorosis scores between fluoridated and non-fluoridated areas. Additionally, there were no children in Simcoe Muskoka with severe fluorosis and less than one per cent with moderate fluorosis.

Table 2: Fluorosis Scores in 7 Year Old Children by Area of Residence, Simcoe Muskoka 2007/08

Geography (based on residence)	# 7 year olds	% With Questionable, Very Mild or Mild Fluorosis (TSIF=1 or 2)	95% Confidence Interval	% with Moderate Fluorosis (TSIF= 3)	95% Confidence Interval	% with Severe Fluorosis (TSIF = 4)
All fluoridated areas of Simcoe Muskoka	220	8.6%	(5.6%, 13.1%)	0.0%		0.0%
All non-fluoridated areas of Simcoe Muskoka	1070	7.9%	(6.4%, 9.6%)	0.4%	(0.1%, 1.0%)	0.0%
Simcoe Muskoka total:	1290	8.0%	(6.6%, 9.6%)	0.3%	(0.1%, 0.8%)	0.0%
Orillia	118	11.9%	(7.1%, 19.1%)	0.0%		0.0%

Data Source: 2007/08 SMDHU research sample

Fluorosis was measured by a registered dental hygienist on the Simcoe Muskoka District Health Unit Oral Health Team according to the following definitions:

Tooth Surface Index of Fluorosis (TSIF) values:

0 = None
1 = (Questionable or very mild fluorosis) - Parchment white colour on less than 1/3 of enamel surface
2 = (Mild fluorosis) - Parchment white colour on 1/3 but less than 2/3 of enamel surface
3 = (Moderate fluorosis) - Parchment white colour on 2/3 or more of the enamel surface
4 = (Severe fluorosis) - Staining and/or pitting in conjunction with 1, 2 or 3

References

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7.3. Comparing Fluoridated And Non-Fluoridated Cities Of A Similar Demographic Profile: Orillia And St. Thomas

When examining dental decay rates, there are many contributing factors that affect dental health to consider other than community water fluoridation. St. Thomas, Ontario is similar to Orillia with respect to many of these factors but St. Thomas has community water fluoridation and Orillia does not. The dental decay rate in Orillia for JK, SK and Grade 2 children is significantly higher than that of St. Thomas.
Comparisons between two regions are most valid when the regions are matched based on all factors affecting dental health except the factor being examined. For example,

Orillia is similar to the city of St. Thomas (Ontario) in education level*, income level** and unemployment rate (2006 Census, Statistics Canada). The Elgin-St. Thomas Health Unit has a similar percentage of people (12 years and older) who brush their teeth twice or more per day as in Simcoe Muskoka (over 80%) but has a significantly lower percentage of people (12 years and older) with dental insurance (56% compared to 66% in Simcoe Muskoka).

In 2010/11, St. Thomas had a decay rate of 1.4 decayed, missing, extracted or filled teeth per child for JK, SK and Grade 2 students. This decay rate for Orillia for the same year and age groups is significantly higher at 2.5 decayed, missing, extracted or filled teeth per child. Furthermore, in the city of St. Thomas, 15% of JK, SK and Grade 2 students had cavities compared to 44% of Orillia children of the same age (Table 4) (Elgin-St. Thomas Health Unit screening data 2010/11, Simcoe Muskoka District Health Unit screening data, 2010/11). Elgin-St. Thomas Health Unit has a significantly lower percentage of the population (12 years and older) who have experienced oral or facial pain or discomfort in the past month (36%) than in Simcoe Muskoka (50%).

**percentage of people ages 35-64 who do not have a certificate, diploma or degree*
***media after-tax income for all census families*

Table 3: Comparison of St. Thomas, Ontario and Orillia, Ontario dental decay rates in school-aged children

Indicator of Socio-Economic Status or Oral Hygiene (source: 2006 Census and Canadian Community Health Survey (CCHS), Cycle 5.1, 2009/2010, Statistics Canada, Share File, Health Planning Branch, Ontario Ministry of Health and Long-Term Care)	**City of Orillia** (**No** water fluoridation)	**City of St. Thomas** (**100%** of population has water fluoridation)	**Simcoe Muskoka** (**7%** of pop. has water fluoridation)	**Ontario** (**76%** of pop. has water fluoridation)
2006 Population	30,260	36,110	479,800	12,160,300
% of all census families that are lone parent families	20.9%	18.0%	14.0%	15.8%
Median after-tax income in 2005 - All census families	$50,199	$55,143	$58,237	$59,377
% in low income after tax - All persons	10.0%	8.5%	6.5%	11.1%
% in low income after tax - Persons less than 18 years	10.7%	10.3%	7.4%	13.7%
% of population 35-64 years old without certificate, diploma or degree	18.3%	19.0%	16.6%	15.0%
Unemployment rate	5.7%	6.3%	5.6%	6.4%

% of population 12+ years old with dental insurance (95% confidence interval)	No Orillia-specific data available	55.9%* (49.8%, 61.9%)**	66.3%* (62.9%, 69.5%)	66.1% (65.2%, 66.9%)
% of population 12+ years old who brush teeth 2+ times/day (95% confidence interval)	No Orillia-specific data available	80.9% (75.6%, 86.3%)**	82.3% (79.4%, 84.9%)	83.3% (82.6%, 83.9%)
Decay Rates for JK, SK, Grade 2, 2010/11 and Self-Reported Oral/Facial Pain (source: SMDHU screening data 2010-2011, data provided by Elgin-St. Thomas Public Health Unit and CCHS)				
Average number of decayed, missing or filled teeth per child	2.5*	1.4*	2.0*	
% of children with cavities	44%*	15%*	39%*	
# children screened	1150	1219	14358	
% of population 12+ years old who had oral or facial pain in past month (95% confidence interval)	No Orillia-specific data available	35.7%* (29.7%, 41.6%)**	50.4%* (46.8%, 54.0%)	46.9% (46.1%, 47.8%)

* indicates statistical significance at $p<0.05$

** indicates Elgin-St. Thomas Health Unit (ESTHU) jurisdiction, which includes non-fluoridated rural areas as well as the fluoridated city of St. Thomas. The City of St. Thomas represents 42% of the ESTHU population.

8. Oral Health Services Offered By The Simcoe Muskoka District Health Unit

Under the requirements of the Ontario Public Health Standards (OPHS), the Simcoe Muskoka District Health Unit's oral health team provides dental screening in all elementary schools in Orillia. The grades screened are determined by the risk level of the school. Children who are eligible based on clinical assessment are offered scaling, pit and fissure sealants or topical fluoride. The health unit also provides and pays for the provision of emergency restorative dental care to children in low-income families through the CINOT (Children in Need of Treatment) dental program, and the Healthy Smiles Ontario dental program. The health unit is also very active in promoting healthy nutrition in schools, municipal centres and to the entire community.

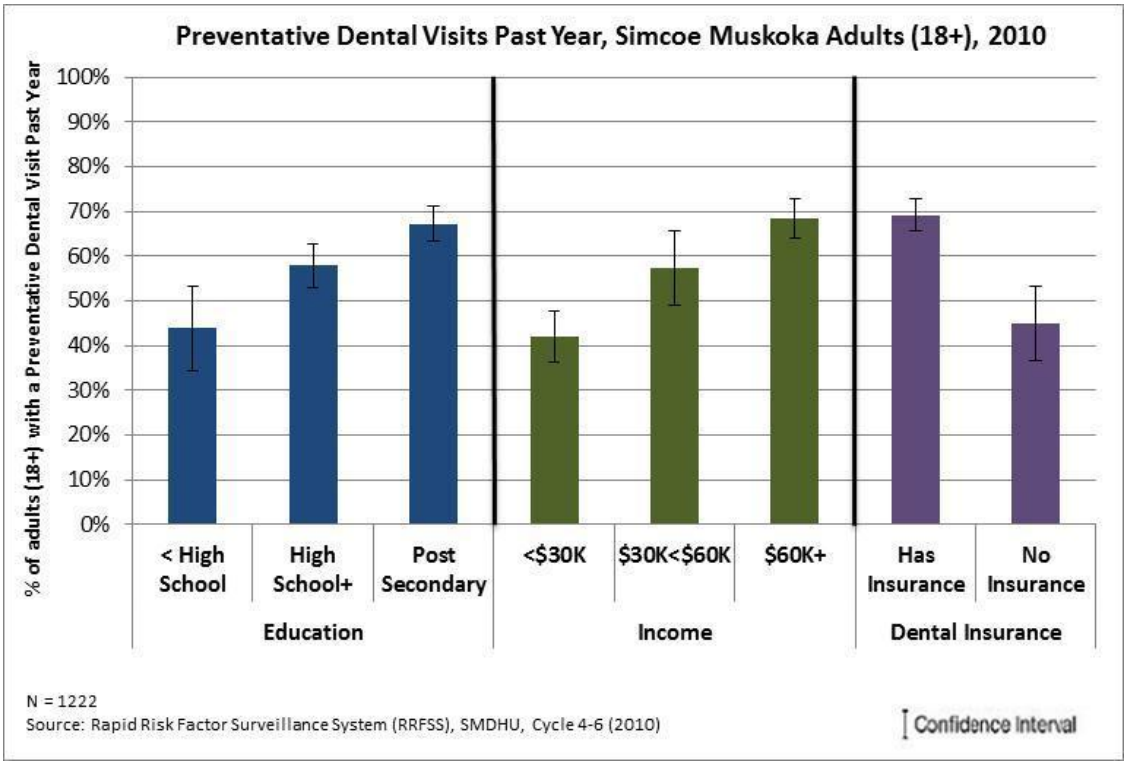
There is no provision in OPHS for the health unit to do oral health education in schools. However, educational sessions may be offered upon request if staff is available to provide sessions. Educational resources for teachers are available on the health unit's website in both English and French. Providing comprehensive oral health classroom education in all schools in Simcoe Muskoka would require hiring an additional three to five oral health staff.

Over and above the services provided by the health unit in schools, oral health and healthy nutrition education is covered under Ontario's health and physical education curriculum. These topics are specifically listed under the curriculum expectation of school teachers in Grade 3 and are referenced as an example in the expectations under the Healthy Living strand in other grades (i.e. full-day kindergarten, Grades 4, 6 and 7).

They are also mentioned as a specific expectation in the revised Grade 2 "Human Development & Sexual Health" topic, which has yet to be approved by the Ministry of Education.[1,2]

Education will not address the issue of decreased access to professional dental care for people without dental insurance who are disproportionately of lower socio-economic status (Figure 4). Community water fluoridation reduces cavities for all, including those who cannot afford to see a dentist. Additionally, community water fluoridation provides benefits over and above other means of preventing cavities, including sources of fluoride such as fluoridated toothpaste.

Figure 4: Percentage of Simcoe Muskoka Adults (18+) Who Have Visited a Dentist in the Past 12 Months for Preventative Care



References

1. The Ontario Curriculum, Grades 1-8: Health and Physical Education, Interim Edition, 2010.
2. The Ontario Curriculum, The Full-Day Early Learning-Kindergarten Program, Draft, 2010.

9. Costs Associated With Providing Oral Health Services In Orillia

Providing, community water fluoridation is inexpensive. Every $1 invested in community water fluoridation yields about $38 in savings each year from fewer cavities treated.[1] According to the American Dental Association "the average lifetime cost per person to fluoridate a water system is less than the cost of one dental filling."[2]

Halton Region is similar to Simcoe Muskoka with respect to population size and percentage of all people and children below the low income cut-offs (see Table 4). Ninety per cent of Halton's population has access to fluoridated water compared to only

seven per cent of Simcoe Muskoka's population. Table 5 shows the much higher costs for the cost-shared Children in Need of Treatment (CINOT) program and Ontario Works dental program in Simcoe Muskoka compared to Halton.

Table 4: Socio-Economic Comparison Between Halton Region and Simcoe Muskoka

Health Unit	Halton	Simcoe-Muskoka
Population (2006)	439,256	479,797
Population 0 to 19 years	117,405	123,105
% in low income after tax - Persons less than 18 years	7.8	7.4
% in low income after tax – All persons	6.5	6.5
% population fluoridated	90	7

Table 5: Spending for Dental Programs in Halton Region and Simcoe Muskoka: Health Unit and Municipal Costs (2009)

Health Unit	Halton 90% Fluoridated	Simcoe Muskoka 7% Fluoridated
CINOT Spending (25% Municipal dollars)	$357,965 ($89,491)	$824,750 ($206,188)
OW Dental <18 Years Spending (20% Municipal dollars)	$109,280 ($21,856)	$421,075 ($84,215)
OW Dental Adult Spending (20% Municipal dollars)	$225,107 ($45,021)	$357,501 ($71,500)
OW Adult dentures (20% Municipal dollars)	$160,360 ($32,072)	$654,603 ($130,921)
Total Spending (Municipal Dollars)	**$852,712** ($188,440)	**$2,257,929** ($492,824)

CINOT = Children in Need of Treatment (Dental Program)
OW = Ontario Works (Dental Program)

The cost of providing CWF in Orillia is estimated to be less than $1 per person per year based on an estimated operating cost of about $25,000 per year. This compares favourably with other means of dental fluoride application. Using population data from Statistics Canada Community Profile for the City of Orillia (2006), Tables 6 and 7 are

estimated costs of providing topical application of fluoride by public health dental hygienists and private dentists.

Table 6: Option 1 – Cost of Topical Application of Fluoride by Public Health Dental Hygienists Twice per Year Plus Promotion of Service

Option 1	Target Population	Annual Budget	One Time Cost (e.g. dental equipment, etc.)
A - All children, all seniors, and adults under LICO (Low Income Cut Off)	14,613	$650,514	$749,505
B - All children, all adults under LICO	8,818	$398,909	$457,696
C - All people under LICO	3,026	$141,213	$158,504

Table 7: Option 2 – Cost of Topical Application of Fluoride by Private Dentists Twice per Year plus Promotion of Service

Option 2	Target Population	Annual Budget	One Time Cost – (e.g. equipment, etc.)
A - All children, all seniors, and adults under LICO (Low Income Cut Off)	14,613	$1,404,733	$12,822
B - All children, all adults under LICO	8,818	$852,406	$11,212
C - All people under LICO	3,026	$293,954	$7,551

References

1. Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. J Public Health Dent 2001;61(2):78-86.
2. American Dental Association. Fluoridation Facts. 2005. www.ada.org/sections/newsAndEvents/pdfs/**fluoridation_facts**.pdf

10. Cost Effectiveness

10.1. Fluoridation Additive Selection And Quantity Calculations

The National Sanitation Foundation (NSF) certifies three products for use in fluoridation:

- Hydrofluorosilicic acid (HFSA)
- Sodium fluorosilicate
- Sodium fluoride

HFSA is the most commonly used fluoridation product in North America and it is the most suitable product for use in Orillia for the following reasons:

- The American Water Works Association's Water Fluoridation Principles and Practices manual indicates that HFSA is suitable for use in systems of the size of Orillia's (i.e. 1,900 L/m or more, serving populations of 10,000 or more).[1]
- Orillia already owns, maintains, and operates similar chemical feed systems for chlorination.
- Chemical feed control and monitoring is more reliable than with some dry feed systems.
- Hazards associated with dust from dry feed chemicals are avoided.

No requirement for chemical pH adjustment is anticipated. The pH of Orillia's treated water (7.8 to 8.1) is near the high end of the acceptable range (6.5 to 8.5), as set by the Ontario Ministry of the Environment. Due to buffering agents naturally present in Orillia's raw water, the addition of HFSA is not expected to cause any significant change in pH.[2]

Based on the current maximum capacity of the Water Filtration Plant (WFP) of 32,958 cubic metres per day, approximately 2154 Litres per month of HFSA will be needed at most. In addition, approximately 429 Litres per month will be required at most for the West Orillia Well (WOW), based on its maximum capacity of 6,550 cubic metres per day.

References

1. American Water Works Association. Manual of Water Supply Practices – M4, Fifth Edition. 2004.
2. Urbansky ET, Schock MR. Can fluoridation affect lead(II) in potable water? Hexafluorosilicate and fluoride equilibra in aqueous solution. Int J Environ Stud 2000;57:597-637.

10.2.Preliminary Design Of Fluoridation Systems

Based on these quantities, purchase and storage of HFSA in 205 L barrels is most practical for the West Orillia Well. A room will need to be constructed inside the existing well house, with proper ventilation and spill containment, for the fluoride feed system and chemical storage.

A bulk tank will need to be purchased and located in the old High Lift Pumping gallery in the lower level of the Water Filtration Plant to provide storage of HFSA. The fluoride feed system can be housed in one of the small rooms also available in this part of the plant. Some minor modifications to add proper ventilation will be required. Bulk storage is more cost effective and eliminates the need for workers to handle barrels of HFSA at the Water Filtration Plant.

10.3.Capital Cost Estimate

A revised capital cost estimate of $160,000 to $180,000 has been prepared.
The estimate has been increased to take into account: bulk storage at the Water Filtration Plant, construction of a ventilated fluoride room at the West Orillia Well, and to ensure worker safety. The initial staff estimate was $50,000 to $100,000.

10.4.Operating Cost Estimate

An operating cost estimate of $25,000 per year will cover supply of HFSA as well as equipment maintenance and upkeep. This works out to a cost per capita of approximately $0.75 per year. Assuming a 30 year life for the capital investment, the total operating and capital is under $1 per year per capita.

11. Concerns Raised And Analysis

11.1.Health Concerns Associated With Community Water Fluoridation

Overall, Health Canada's review of the available science concludes "…the weight of evidence does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects including immunotoxicity, reproductive and/or developmental toxicity, genotoxicity, and/or neurotoxicity." It also concludes the evidence does not support a link between exposure to fluoride in drinking water and cancer or intelligence quotient deficit.[1]

11.1.1. Dental Fluorosis

According to the findings and recommendations from Health Canada's Expert Panel, very mild and mild dental fluorosis in Canada is not elevated.[2] The Canadian Health Measures Survey, which surveyed 1,070 Canadian children aged 6 to 11 years between 2007 and 2009, found no severe fluorosis, almost no moderate fluorosis and very little mild (4%) or very mild fluorosis (12%) (Table 8).[3]

Table 8: Level of Fluorosis in Canadian Children, 6-12 years, 2007-2009

2007-09 Survey
(Canadian Health Measures Survey)
of 6-12 year olds

Normal teeth	Questionable[1]	Very Mild	Mild	Moderate /severe[2]
60%	24%	12%	4%	<0.3%

[1] Ill defined and could be due to antibiotic usage, infection, severe fever, trauma etc.
[2] Highly unstable numbers

Report on the Findings of the Oral Health Component of the Canadian Health Measures Survey 2007-9. Health Canada 2010

Dental fluorosis occurs during tooth development, from birth to about five years of age, if higher than optimal levels of fluoride are ingested. After the enamel is completely formed, dental fluorosis cannot occur. Older children and adults are therefore not at risk for dental fluorosis. Dental fluorosis in its questionable, very mild, and mild forms has no effect on tooth function. These types of fluorosis are not readily noticeable and often require a trained dental professional to detect.

A 2006 study of fluorosis prevalence showed that in most areas of eastern Canada, including Ontario, the prevalence of all levels of dental fluorosis is quite low. Health Canada states that since 1996 there has been an "overall decreasing trend of dental fluorosis in Canada".[2]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p.35).

References

1. Health Canada. Findings and Recommendations of the Fluoride Expert Panel (January 2007). http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php
2. Health Canada (2008) Findings and recommendations of the Fluoride Expert Panel Meeting. Water, Air and Climate Change Bureau, Safe Environments Programme, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa.
3. Health Canada, Summary of the Oral Health Component of the Canada Health Measures Survey 2007 – 2009. Minister of Health, 2010. Summary Report Page 14 www.fptdwg.ca/English/e-documents.html

11.1.2. Thyroid Function

The European Commission's Scientific Committee on Health and Environmental Risk SCHER report states: "Human studies do not suggest adverse thyroid effects at realistic human exposures to fluoride."[1]

Iodine is important for the production of thyroid hormones, which is why iodine is added to salt. Low iodine intake leads to low thyroid function (hypothyroidism) and/or an enlargement of the thyroid gland in the neck (goiter). The possibility that fluoride may contribute to low thyroid function is explored in the US National Research Council report.[2] In this report, several animal and human studies are quoted. Some of these studies suggest an association between fluoride and abnormal thyroid function at high fluoride levels and/or when iodine levels are levels are low.

Many of the human studies were performed in developing countries where there are nutritional deficiencies not commonly seen in developed countries like Canada. Because the studies mostly involve high fluoride levels and/or low iodine levels and take place in developing countries, the findings have little relevance to Orillia where fluoride levels are low, iodine intake is adequate, and there is very different nutritional intake compared to developing countries. A review of conventional sources of medical information reveals that fluoride exposure is not discussed as a cause of hypothyroidism.[3-7]

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 30).

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11.1.3. Kidney Function

The data are deemed to be too limited to determine any negative health effects on kidney function or on those with kidney disease from the consumption of water with fluoride concentrations of those with CWF (0.7 mg/L).[1] Some large community-based epidemiological studies in the UK found "no increased renal disease associated with long term exposure to drinking water with fluoride concentrations of up to 8mg/l."[2] The National Research Council report indicates that in communities where fluoride levels in drinking water are 4.0 mg/L there may be an increased risk of fractures or other effects in people with kidney problems.[3] At this level the fluoride is much higher than the level in Orillia's drinking water currently (natural fluoride concentration 0.2 mg/L) or if fluoridated (artificial fluoride concentration 0.7 mg/L).

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p. 38).

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1. Fawell J, Bailey K, Chilton E, Dahi E, Fewtrell L, Magara Y. (2006). "Fluoride in Drinking Water" World Health Organization. http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water_full.pdf
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11.1.4. Musculoskeletal Effects

11.1.4.1. Skeletal Fluorosis

Health Canada's Expert Panel on fluoride states: "The primary functional adverse effect associated with excess fluoride intake (after dental fluorosis) is still skeletal fluorosis (milder forms), likely to occur at about 10 mg/day after 10 or more years of exposure. Definitions of the different stages of skeletal fluorosis should be developed." [1] The fluoride concentration recommended by Health Canada of 0.7 mg/L was made taking into account measures of all sources of fluoride consumption by a full range of age groups in order to be both safe and effective.[1]

Based on Health Canada's review, skeletal fluorosis is not a risk from water that has adjusted fluoride levels, as very high levels of fluoride intake are required before skeletal fluorosis will develop.[2] At very high levels fluoride can lead to skeletal fluorosis, a condition where fluoride accumulates in the bone and results in crippling calcifications in the joints, ligaments and vertebral bodies. It is a problem seen in developing countries with naturally occurring very high levels of fluoride in their water.

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 32.

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1. Health Canada. Findings and Recommendations of the Fluoride Expert Panel (January 2007). http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php
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11.1.4.2. Bone Fractures

A review was conducted in the UK of 29 studies that assessed the fracture risk of water fluoridated at levels closest to 1.0 mg/L compared to the lowest water fluoride level reported. The review concluded that, based on the best available evidence, fluoride was not associated with bone fractures.[1] An Australian review came to a similar conclusion, and stated that the authors of the three existing systematic reviews concur that water fluoridation at levels aimed at preventing dental cavities has little effect on fracture risk – neither protective nor deleterious.[2]

The National Research Council review concluded that drinking water concentrations of 4 mg/L (well above the concentrations used with CWF) are likely to increase fracture rates compared with exposure to fluoride at 1 mg/L, particularly in some susceptible groups that are prone to accumulating fluoride into their bones (such as those with kidney problems) but no conclusions could be drawn about risk at 2 mg/L.[3]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 32).

References

1. McDonagh M, Whiting P, Bradley M et al. A Systematic Review of Water Fluoridation. 2000 NHS Centre for Reviews and Dissemination, University of York. Page 67. http://www.york.ac.uk/inst/crd/fluorid.htm,
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11.1.5. Carcinogenicity

11.1.5.1. Cancer

According to Health Canada's Expert Panel on fluoride the "weight of evidence does not support a link between exposure to fluoride and increased risks of cancer."[1]

Many epidemiologic studies have been conducted to evaluate the relationship between fluoride in drinking water and cancer. A number of expert committees have reviewed these studies and concluded that there is no clear association between water fluoridation and cancer.[2,3] For example, in a review done in the UK of 26 studies on cancer, 24 studies found no increase in cancer, one study found an increase and one study found a reduction in cancer with CWF.[2,3,] The recent Health Canada report states the weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to **cancer**, immunotoxicity, reproductive/developmental toxicity, genotoxicity and/or neurotoxicity.[1, 4]

A study of 20 American cities conducted in the 1970's that found increased cancer deaths in fluoridated communities [5] was further investigated by the National Cancer Institute, and it was determined that the study had failed to take into account the widely accepted risk factors known to affect the death rate for specific cancers.[6] Ethnic composition of the population, geographic location, socioeconomic status, ages and sex differences had all been disregarded.[6] In addition, when the data from the study were re-analyzed using standard procedures to account for these factors, the difference in cancer death rates was found to be due to the age and racial makeup of the respective populations.[7]

On October 12, 2011, an expert panel in California (California Proposition 65 Carcinogen Identification Committee) assessed whether fluoride should be added to a list of cancer causing agents (carcinogens), and based on a review of the evidence unanimously voted to not list fluoride as a carcinogen.[8]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 32).

References

1. Health Canada. Findings and Recommendations of the Fluoride Expert Panel (January 2007). http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php
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11.1.5.2. Osteosarcoma

The European Commission SCHER report states: "There is not sufficient evidence linking fluoride in the drinking water to the development of osteosarcoma."[1]

Osteosarcoma is a rare form of bone cancer. The concern about osteosarcoma in relation to fluoride arose from one animal study that found that male rats given very high doses of fluoride (100 - 175 mg/L) in their drinking water had a small increased risk of developing osteosarcoma compared to control rats. This effect was not seen in two other studies involving rats exposed to fluoride, although a study in mice showed an increase in noncancerous bone tumours at very high fluoride doses.[2]

Many human studies have been performed with regard to cancer and fluoride. Most show no risk of cancer, including osteosarcoma; however, a few suggest an association between osteosarcoma and fluoride, including a PhD research study which found an association between osteosarcoma and fluoride levels in boys, based on the fluoride levels they were exposed to at younger ages when bones were growing.[3, 4] The National Research Council report describes this study as having "important strengths and major deficits."[5] A more recent study looked at fluoride levels in the bone adjacent to osteosarcoma and did not demonstrate an association between fluoride levels in bone and osteosarcoma.[6]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 33).

References

1. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011, pg. 39. http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf
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5. Kim FM et al. Journal of Dental Research, October 2011; 90(10):1171-1176.

11.1.6. Neurotoxicity

11.1.6.1. Pineal Gland

The pineal gland is a small organ located near the centre of the brain. It produces a hormone called melatonin which is involved in the sleep-wake cycle and the onset of puberty and menopause. The National Research Council report reviewed the few studies (one animal and two human studies) that assess fluoride in relation to the pineal gland and found no evidence that fluoride damages the pineal gland and very little evidence that fluoride has any effect on the functioning of the pineal gland aside from one study in gerbils fed very high amounts of fluoride.[1,2]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 36).

References

1. National Research Council of National Academies, Committee on Fluoride in Drinking Water, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. 2006. National Academies Press. Washington. D.C. Pages 252-256. http://www.nap.edu/catalog.php?record_id=11571
2. Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride December 2010. Page 63. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php

11.1.6.2. Intelligence Quotient

According to the European Commission SCHER report: "Fluoride intake from drinking water at the level occurring in the EU does not appear to hamper children's development and IQ levels."[1]

Several studies have assessed IQ and fluoride levels, all from developing countries, most commonly in rural communities in China.[2] Studies that compare the IQ levels in such settings are problematic because it is difficult to know if the differences in IQ are true findings or if they are related to problems with how the studies were conducted, such as failing to identify, measure and account for other causal exposures. For example, IQ is known to be influenced by reduced thyroid function (which can occur with reduced dietary iodine) and with lead exposure. Very few of the fluoride studies assess these other exposures that may impact IQ.[3,4]

The average fluoride levels in drinking water in these studies were approximately three to five times higher than Orillia's drinking water concentrations would be if fluoridated at a level of .7 mg/L Thus, the applicability of findings in these developing country settings to communities in developed countries is unknown. Two studies on childhood behavior and CWF in developed countries found no negative impacts.[5-6]

Health Canada's report states: "… the weight of evidence does not support a link between fluoride and intelligence quotient deficit, as there are significant concerns regarding the available studies, including quality, credibility, and methodological weaknesses. These conclusions are in agreement with the findings and

recommendations of the 2007 Expert Panel Meeting on fluoride held in Canada (Health Canada, 2008)."[7]

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 35).

References

1. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011, pg. 39. http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf
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3. Xiang Q., Liang Y., Chen L. et al. Effects of fluoride in drinking water on children's intelligence. Fluoride 2003;36(2):84-94. As quoted in the National Research Council report. Page 205.
4. Xiang Q., Liang Y, Zhou M et al. Blood lead of children in Wamiao-Xinhuai intelligence study (letter). Fluoride 2003;36(3):198-199. As quoted in the National Research Council report. Page 206.
5. Shannon FT, Fergusson DM, Horwood LJ. Exposure to fluoridated public water supplies and child health and behaviour. New Zealand Medical Journal, 11 June 1986; 416-418.
6. Morgan L, Allred E, Tavares M, Bellinger D, Needleman H. Investigation of the possible associations between fluorosis, fluoride exposure, and childhood behavior problems. American Academy of Pediatric Dentistry 1998;20:4; 244-252.
7. Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride December 2010 http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php

11.1.7. Human Reproduction

The European Commission SCHER Report states: "There is no new evidence from human studies indicating that fluoride in drinking water influences male and female reproductive capacity."[1]

The most studied birth defect is Down's syndrome. A review of the literature conducted in 2001 stated that an association between water fluoride concentrations and Down's syndrome was inconclusive.[2] Overall, the National Research Council report concluded that "studies of fluoride's effects on human development are few and have some significant shortcomings in design and power, limiting their impact".[3] The reports also states "A few studies of human populations have suggested that fluoride might be associated with alterations in reproductive hormones, fertility, and Down's syndrome, but their design limitations make them of little value for risk evaluation."[4] Furthermore, Health Canada concludes that "The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to cancer, immunotoxicity, **reproductive/developmental toxicity**, genotoxicity and/or neurotoxicity."[5]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 36).

References

1. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health

effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011, pg. 40. http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf
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3. National Research Council of National Academies, Committee on Fluoride in Drinking Water, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. 2006. National Academies Press. Washington. D.C. Pages 203-204. http://www.nap.edu/catalog.php?record_id=11571
4. National Research Council of National Academies, Committee on Fluoride in Drinking Water, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. 2006. National Academies Press. Washington. D.C. Page 204. http://www.nap.edu/catalog.php?record_id=11571
5. Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride December 2010. Page 1. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php

11.2. Fluoride Exposure

The total intake of fluoride from all sources (water, beverages, food, air, and toothpaste) was estimated in the Health Canada review as a key consideration in the determination of their recommendations. The concentrations recommended for community water fluoridation were determined to result in fluoride consumption levels that are safe and effective in preventing cavities.[1]

11.2.1. Dermal And Inhalation Absorption

Human skin serves an important role by protecting us from external factors in the environment. Each skin cell is surrounded by a protective cell membrane composed largely of fatty compounds known as lipids. These cell membranes are particularly adept at resisting penetration by water molecules and electrically-charged atoms (or ions) dissolved in water, such as fluoride ions.[2] This is why our bodies don't absorb water through our skin. It is also the reason that our bodies don't absorb salts or other ionic compounds when we swim in the ocean. Seawater, in addition to numerous other salts, has a fluoride concentration of approximately 1.3 mg/L.[3]

A review of the primary literature found no studies specifically on the topic of dermal (skin) absorption of fluoride from fluoridated water. Papers looking at exposure routes for fluoride primarily focus on ingestion. The major cited routes of fluoride exposure are the consumption of water, beverages and foods (including those that are processed or made with fluoridated water), and the ingestion of dental products such as fluoridated toothpaste.[4,5]

Similarly, the Scientific Committee on Health and Environmental Risk (SCHER) found that no experimental data exists on the dermal absorption of fluoride from water. SCHER also suggests that because fluoride is an ion it is not expected to be absorbed through the skin when in a water solution with near neutral pH.[6]

Another possible exposure pathway when showing or bathing is inhalation. No studies on the inhalation of fluoride from showering or bathing were found. SCHER states that this exposure pathway is unlikely to contribute significantly to the body burden of fluoride in the general population.[6]

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 39).

References

1. Health Canada. Fluoride in Drinking Water - Prepared by the Federal-Provincial-Territorial Committee on Drinking Water - Document for public comment. http://www.hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/draft-ebauche-eng.php#t13
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3. Dobbs, G.G. 1974. Fluoride and the environment. Fluoride 7:123–135.
4. Agency for Toxic Substances & Disease Registry (ATSDR). Toxic Substances Portal – Fluorine, Hydrogen Fluoride, and Fluorides. http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=212&tid=38
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6. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011, pg. 40. http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf

11.2.2. Infant Formula

Concern has been expressed about perceived dangers in giving baby formula made with fluoridated water to infants. The following is stated with regard to fluoridated water and infant formula preparation (and hence use of fluoridated water for children under 12 months of age) by health organizations:

Health Canada: Can I Prepare Baby Formula Using Fluoridated Water?
Yes. Infant formula prepared with water fluoridated at the optimal level of 0.7 mg/L maximizes the protective role of fluoride during the development of the permanent teeth while minimizing the risk of dental fluorosis.[1]

American Dental Association: The panel suggested that when dentists advise parents and caregivers of infants who consume powdered or liquid concentrate infant formula as the main source of nutrition, they can suggest the continued use of powdered or liquid concentrate infant formulas reconstituted with optimally fluoridated drinking water while being cognizant of the potential risks of enamel fluorosis development.[2]
Centers for Disease Control and Prevention: Can I use optimally fluoridated tap water to mix infant formula?
Yes, you can use fluoridated water for preparing infant formula. However, if your child is exclusively consuming infant formula reconstituted with fluoridated water, there may be an increased chance for mild dental fluorosis. To lessen this chance, parents can use low-fluoride bottled water some of the time to mix infant formula; these bottled waters are labeled as de-ionized, purified, demineralized, or distilled.[3]

It should be noted that acceptable adjusted and natural fluoride levels in the United States are higher than in Canada, and therefore fluorosis levels in the United States are higher than in Canada. This may explain the slightly more conservative language in American recommendations noted above.

Source: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (pg. 29).

References

1. Health Canada: http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/health-sante/faq_fluoride-fluorure-eng.php
2. American Dental Association, The Journal of the American Dental Association January 2011 vol. 142 no. 1 79-87 http://jada.ada.org/content/142/1/79.full#sec-18
3. Centers for Disease Control and Prevention (CDC) http://www.cdc.gov/fluoridation/safety/infant_formula.htm

11.3. Ecological Considerations – Impact Of CWF On The Aquatic Environment

Lake Simcoe, Lake Couchiching, the Great Lakes, and all natural water sources contain fluoride ions. Although fluoride ions are always present in natural water sources, very high levels of fluoride can be harmful to the aquatic environment. In 1999, the Canadian Council of Ministers of the Environment (CCME) established an Interim Guideline for total inorganic fluorides of 0.12 mg/L for the protection of freshwater life.[1] Interim Guidelines are defined as follows:

"interim guideline: For sediment, water, and tissue residue guidelines: a guideline value derived from a data set that has met a lesser CCME requirement than that of a full guideline. Once data gaps are addressed by the scientific community, a full guideline may be derived."

As of 2012, a full guideline has not been derived.

In Ontario, the Ministry of the Environment (MOE) regulates discharges to the environment, and Orillia's wastewater treatment centre must meet the MOE's Provincial Water Quality Objectives, which are established to ensure that the water quality is satisfactory for aquatic life and recreation. There is no Ontario Provincial Water Quality Objective for fluoride.

The province of British Columbia however, has established "Ambient Water Quality Criteria for Fluoride".[2] The overview report that established BC's fluoride criteria notes that "The main sources of fluoride contamination in BC are the Alcan aluminum smelter in Kitimat and the Cominco fertilizer plants in Trail and Kimberley" The report also notes that "Most fish are much less sensitive to fluoride than are trout or salmon", and that the fluoride criteria "is designed for soft, coastal waters where Oncorhynchus species (Pacific Salmon and Trout) reproduce".

The BC criteria states that "The total fluoride concentration of fresh waters should not exceed 0.4 mg/L when hardness is 10 mg/L, otherwise use the equation: LC50 fluoride = -51.73 + 92.57 Log10 (Hardness) and multiply by 0.01". In other words, for very soft water any discharges must not raise the total fluoride concentration of the natural water above 0.4 mg/L. Since water hardness affects the toxicity of fluoride ions to fish, they provide a formula to calculate the criteria for harder water.

Orillia's drinking water would be fluoridated to a target value of 0.7 mg/L. When water goes down our drains, it mixes and dilutes with groundwater, stormwater, and backwash water from the WFP that also enters our sanitary sewer system. Flows to the Waste Water Treatment Centre have been measured to be, on average, 30% higher than

metered water used by homes and businesses. So, even before this water is greatly diluted in Lake Simcoe, the fluoride content will be reduced from 0.7 to 0.54 mg/L.

However, the water in Lake Simcoe is not "very soft water"; it's moderately hard water, on the order of 120 mg/L. Based on this, the BC formula provides a criteria value of 1.5 mg/L. That is, the BC criteria that was designed to protect the highly sensitive Pacific Salmon and Trout, would allow for a fluoride concentration in Lake Simcoe water of 1.5 mg/L; a value that is much higher than could result from the discharge of fluoridated drinking-water. Again, the BC criteria were designed to regulate industrial waste discharges to natural waterways.

In 2004, a paper titled "Water Fluoridation and the Environment: Current Perspective in the United States" was published in The International Journal of Occupational and Environmental Health.[3] In the paper, "Evidence of water fluoridation's effects on plants, animals, and humans is considered based on reviews by scientific groups and individual communities". The following is reproduced from the paper's conclusions:

"There appears to be no concern about the environmental aspects of water fluoridation among those experts who have investigated the matter."

In 2011, the European Commission's Scientific Committee on Health and Environmental Risks (SCHER) published a report titled "Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water".[4]

Among the conclusions of the SCHER report is the following:

"Based on three lines of evidence, a simplistic risk assessment, mass balance modelling and a modified EUSES analysis, SCHER is of the opinion that adding fluoride to drinking water at concentrations between 0.8 mg F-/L and the reference dose level of WHO (1.5 mg F-/L) does not result in unacceptable risk to water organisms."

It should be noted that the City of Orillia would fluoridate to a concentration of 0.7 mg/L, which is lower than the range of fluoride concentrations that SCHER evaluated.

References

1. Canadian Council of Ministers of the Environment. 2002. Canadian water quality guidelines for the protection of aquatic life: Inorganic fluorides. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.
2. http://www.env.gov.bc.ca/wat/wq/BCguidelines/fluoride/fluoridetoo-04.html
3. Pollick, H. Water Fluoridation and the Environment: Current Perspective in the United States. INT J OCCUP ENVIRON HEALTH 2004;10:343–350
4. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. May, 2011.

11.4. Ethical And Philosophical Considerations

11.4.1. Freedom Of Choice Of Individuals

The ethical aspects of drinking-water fluoridation were very recently addressed in the province of Quebec. Whereas fluoridation is a common practice in Ontario and the United States, it is relatively uncommon in Quebec. The Public Health Ethics Committee (CESP) of the National Public Health Institute of Québec was recently asked to comment upon the ethics of drinking water fluoridation. On March 21, 2012, the CESP released their report, and the Executive Summary is reproduced below:

EXECUTIVE SUMMARY

"This opinion relates to a project submitted by the National Public Health Director to amend the Regulation respecting the quality of drinking water of the Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP – Ministry of Sustainable Development, Environment and Parks) to include a mandatory minimum standard for fluoride of 0.7 mg/l for all Québec municipalities with populations of 5,000 or more.

Tooth decay and its consequences are a major public health concern affecting the entire Québec population. By way of illustration, tooth decay affects 42% of the province's kindergarten children. In addition, Québec children have 40% more cavities than their counterparts in Ontario and the United States. In Québec, dental treatment costs exceed $2 billion.

The fluoridation of drinking water is presented in the literature as one of the safest, most effective, economical and equitable ways of reducing tooth decay. It has a greater impact on disadvantaged populations, and thus helps reduce health inequalities. The negative effects of fluoridation on health and the environment are not significant enough to outweigh the benefits.

However, the fluoridation of a population's water supply system will inevitably run counter to the wishes of part of that population. To force people to live more healthily against their will is certainly not a trivial matter. It is therefore important to explore ways to mitigate the consequences of such a measure on the free choice of individuals.
In conclusion, the CESP takes the view that the benefits of fluoridation outweigh its potential negative effects on health and the environment and that such benefits justify impinging on the freedom of choice of people who do not wish to have their water fluoridated. This opinion offers ways to mitigate these negative consequences on target populations; these include informing and consulting the public and inviting it to participate in the process leading to the change in regulations on the quality of drinking water." [1]

Governments and health professionals have a responsibility to make decisions and implement public health strategies that balance community health outcomes with individual choices. Adjusting the level of fluoride in drinking water can be compared to practices such as adding iodine to salt for thyroid health and adding folic acid to cereals to reduce neural tube defects.

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p.17).

References

1. Comite d'ethique de santé publique - Institut national de santé publique du Quebec. Opinion on a project to fluoridate drinking water. March 2012.

11.4.2. Health Experts Have Been Wrong Before

It is correct that throughout the history of scientific endeavour, incorrect conclusions have been drawn. We know this to be true because scientific methodology has revealed these errors. Such errors can be made through the neglect of accepted scientific methods, or as a result of an identifiable weakness in the accepted scientific methodology. In the case of the latter, root cause analysis is performed to identify and correct the methodological weakness so that similar errors are avoided in the future. Through this process, the scientific method constantly evolves and improves.

Current scientific methodology is our most effective tool to improve or verify our understanding of natural phenomena. It is for this reason that scientists value the process of publishing their findings in peer-reviewed academic journals. Through this process, new research is reviewed by recognized experts in the field, prior to publishing. These experts review the research methodology to ensure adherence to current scientific practices. Once published, the research findings are subject to review by the entire scientific community, who may challenge the conclusions drawn by using the same process of peer-reviewed research.

It is for these reasons that the Simcoe Muskoka District Health Unit looks to the existing peer-reviewed scientific literature when asked to evaluate a claim such as "fluoride causes autism", or "fluoride causes diabetes". If such a conclusion was published in a peer-reviewed scientific journal, this would lend substantial credence to the claim. But if such assertions are made without exposure to the peer-review process, then they cannot be considered to be supported by modern science.

In this report, the Public Works Department has recommended the fluoridation of the City of Orillia's drinking water. This recommendation is based upon the recommendations of the World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Simcoe Muskoka District Health Unit, and on the understanding that these individuals and organizations are committed to making decisions and recommendations based upon current scientific evidence. It is important to note that a recommendation based on scientific evidence can change in the future, based on new, peer-reviewed evidence. If the agencies listed above alter their recommendation in the future with respect to drinking-water fluoridation, Administration will provide that information to Council, so that the best evidence-based decisions can be made.

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p.41).

11.5. Operational And Occupational Health And Safety Concerns

11.5.1. Material Handling And Storage, Worker Safety

The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labelling of containers of WHMIS "controlled products", the provision of material safety data sheets (MSDSs) and worker education and training programs. MSDSs are readily obtainable from many sources. A typical MSDS for HFSA is provided in *Appendix I*.

It should be noted that the information listed on the MSDS for HFSA applies to HFSA in its concentrated form. This information is provided in the event that workers are accidentally exposed to concentrated HFSA, or if concentrated HFSA is accidentally released to the environment. WSIB reports that there have been zero lost time injuries of municipal water systems workers related to fluoridation chemicals in the last five years (see WSIB report in *Appendix J*).

As addressed later in this report, when HFSA is diluted into drinking-water, the HFSA molecules become completely dissociated; that is, by interacting with water molecules, the ions (predominantly fluoride) that make up the HFSA separate from each other and disperse into the water. Because of this dissociation, the HFSA that is added to the water actually ceases to exist as HFSA, and the information on the MSDS ceases to apply.

People do not ingest, and are not exposed to HFSA when they drink fluoridated water. Similarly, no HFSA exists in the tap water that we return to the environment.

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p.47).

11.5.2. Transportation Safety

The City of Orillia, like all municipalities in Ontario, is bound by legislation to follow strict handling protocols for all hazardous chemicals. Chemicals used for community water fluoridation fall under that legislation as well. Health Canada states: “Fluoridation additives certified for use in drinking water are not classified as hazardous waste in Canada.”[1]

According to Environment Canada, when transported in its concentrated form, hydrofluorosilicic acid is “identified as a dangerous good under the Transportation of Dangerous Goods Regulations and has been classified as a Class 8 corrosive substance”.[2]

It is important to remember that many hazardous materials are transported continuously through communities by air, rail, and on roads and highways following these protocols. In the rare event an accident occurs with any substance, there are trained, equipped and qualified agencies and services using established Hazmat procedures to isolate, control and clean-up any hazardous spills that may occur. First responders advise that

precautionary measures would include isolating the area 50 metres in all directions around a spill and 800 metres in all directions for a fire.

References

1. Joint Government of Canada Response to Environmental Petition No. 221 filed under Section 22 of the Auditor General Act. Received November 19, 2007. Petition to Discontinue Water Fluoridation March 18, 2008, p.2.
2. Canadian federal transportation regulations, http://www.tc.gc.ca/tdg/clear/tofc.htm

11.5.3. Adequacy Of Monitoring And Control Of Fluoride Feed Systems

With proper planning and maintenance of the system, fluoride adjustment is comparable with other water treatment process. Today's equipment allows water treatment personnel to easily monitor and maintain the desired fluoride concentration. Automatic monitoring technology is available that can help to ensure that the fluoride concentration of the water remains within the recommended range.

Because there is more than 60 years of experience with water fluoridation, there is considerable guidance on sound engineering practices to design, construct, operate, and maintain water fluoridation systems. Fluoride additives are introduced to the water supply as liquids, but are measured by solution feeders (metering pumps). By design, and with proper maintenance and testing, water systems limit the amount of fluoride that can be added to the system so prolonged over-fluoridation becomes a mechanical impossibility.

It is anticipated that Orillia's fluoridation feed systems would add fluoride prior to the entrance of the chlorine contact chamber and monitor fluoride levels near to the discharge from this chamber. Feeder output would be adjusted based on fluoride levels detected by the fluoride analyzer. Safeguards used to ensure that fluoride adjustment is within the recommended range include:

- Continuous monitoring of fluoride levels before water enters the distribution system, using online fluoride analyzers.
- Electrical interlocking of fluoride feed pumps so that fluoride feed system cannot operate unless water is being produced.
- Use of a day tank with systems that use bulk storage, so that only a limited supply of chemical is directly connected to the suction side of fluoride feed pumps.
- Periodic sampling of fluoride levels throughout the water distribution system.
- Use of weigh scales for day tanks or drums and regular monitoring of weights to provide a redundant check of the amount of fluoride being fed.

Municipal Drinking Water Systems in Ontario that fluoridate their water supply are required to analyze samples taken once per day for fluoride content. The Ontario Ministry of the Environment reports that 78 of the Municipal Drinking Water Systems that it regulates add fluoride, and none of these have reported a fluoride exceedance in the last two years.[1]

References

1. Email communication with Drinking Water Supervisor, Ontario Ministry of the Environment, Barrie Office, Feb 28, 2012

11.5.4. Fluoridation And Lead Levels In Drinking Water

Community water fluoridation does not cause an increase in the amount of lead in drinking water or increase lead leaching from plumbing fixtures. Fluoridated water at optimal levels does not increase the amount of lead absorbed into or the amount that accumulates in the body. Drinking fluoridated water does not increase the risk of any mental disorders or decrease in mental abilities. A number of reviews on community water fluoridation have studied the scientific literature and have concluded that water fluoridation has no effect on the solubility, bioavailability, or bioaccumulation of any form of lead.[1,2,3,4]

Concern that using fluorosilicate additives to fluoridate drinking water causes water system pipes to corrode is not supported by science. At the level recommended by Health Canada for fluoridation of public water supplies (0.7 mg/L), the fluoride ion has little influence on either corrosion or the amounts of corroded metals released into the water. Fluorosilicates contribute to better water stability with less potential for corrosion, because silica stabilizes the pipe surface.

Waters differ in their resistance to changes in their chemistry. All waters contain divalent metals such as calcium and magnesium that cause water to have properties characterized as hardness and softness. If a water is “hard,” it is less likely to “leach” metals from plumbing pipes but often leaves a deposit on the inside of the pipe, while if a water is “soft” it has less of a tendency to leave deposits on the inside of plumbing pipes. The tendency of water to be corrosive is controlled principally by monitoring or adjusting the pH, buffer intensity, alkalinity, and concentrations of calcium, magnesium, phosphates, and silicates in the water.

Orillia does not currently practice chemical adjustment of its water for the purpose of reducing corrosion, and no requirement to introduce this practice along with fluoridation is anticipated. The pH of Orillia’s treated water (7.8 to 8.1) is near the high end of the acceptable range (6.5 to 8.5), as set by the Ontario Ministry of the Environment. In addition, Orillia’s source water is naturally “hard” meaning that, due to buffering agents naturally present in Orillia’s raw water, the addition of HFSA is not expected to cause any significant change in pH.

In a paper[5] from the U.S. Environmental Protection Agency published in the International Journal of Environmental Studies in 2000, the authors examine recent studies that have attempted to show a link between fluoridation of drinking water and increased levels of lead in the blood. The paper looks at established science and compiles fundamental chemical literature, placing an emphasis on the chemistry and conditions of most relevance to public drinking water. The overall conclusions are that no credible evidence exists to show that water fluoridation has any quantifiable effects on the solubility, bioavailability, bioaccumulation, or reactivity of lead compounds. Additional conclusions in the paper include:

- Dissociation of HFSA in typical drinking water is complete and instantaneous.
- No significant change in pH is attributable to the addition of HFSA to typical drinking water to increase fluoride to recommended levels.

The authors also consider and refute the methodology of some previous epidemiological studies of lead exposure. Concerns with lead and community water fluoridation were raised by several published reports by Masters and Coplan (1999, 2000, 2007) who suggested an association between elevated blood levels of lead in children with possible neurotoxicity and living in communities that used silicofluorides to fluoridate their drinking water.[6, 7, 8] These reports have been refuted by Urbansky and Shock (2000) who contend that Masters and Coplan failed to control for other factors that may have contributed to blood lead levels, and failed to link lead levels with actual consumption of optimally fluoridated drinking water.[5] Urbansky and Shock also point out that the mechanism for how silicofluoride increases blood lead levels proposed by Masters and Coplan fails to account for the fundamental chemistry involved in the interaction between not only fluoride and lead but the other chemical constituents normally found in drinking water.

A different result from Masters and Coplan was reported by Macek et al (2006) using data from 9,477 children aged 1-16 years. They found "overall, the PbB (blood lead) concentrations of children living in counties receiving silicofluorides (sodium silicofluoride and hydrofluosilicic acid) did not differ significantly from the PbB concentrations of children living in counties without fluoridated water."[9] Macek et al's research confirmed the findings of the Fort Collins Technical Study Group (2003) who reported no correlation between elevated childhood blood lead and percent of the population receiving hydrofluorosilic acid (HFSA) treated water in Colorado counties after statistical regression analysis which controlled for percent of housing with high-risk lead housing in each county.[3]

In their articles Masters and Coplan proposed a mechanism for the increased blood lead levels in children living in communities that used HFSA to fluoridate the drinking water. They contend that HFSA does not completely hydrolyze and that HFSA corrodes lead-bearing plumbing fixtures, thereby elevating the level of lead in the drinking water.[7,10] Urbansky and Shock in their study show that HFSA completely hydrolyzes into fluoride ions and silicates and so cannot cause corrosion and increased lead levels in drinking water.[5] This was also confirmed by testing by the Fort Collins Utilities who reported that lead levels in drinking water were below the detectable limits (0.001 mg/L) before and after addition of HFSA.[3]

References

1. Institute national de sante publique du Quebec. Water Fluoridation: An analysis of the Health Benefits and Risks. June 2007
2. British Fluoridation Society. One in a Million: The Facts About Fluoridation. 2nd Ed. 2004
3. Report of the Fort Collins Technical Study Group – April 2003
4. Jackson PJ, Harvey PW, Young WF. Chemistry and Bioavailability Aspects of Fluoride in Drinking Water. Report No.: CO 5037. July 2002
5. Urbansky ET, Schock MR. Can fluoridation affect lead(II) in potable water? Hexafluorosilicate and fluoride equilibra in aqueous solution. Int J Environ Stud 2000;57:597-637.
6. Masters RD, Coplan MJ. Water treatment with silicofluorides and lead toxicity. Intl J Environ Studies 1999; 56: 435-449.
7. Masters RD, Coplan MJ, Dykes JE. Association of silicofluoride treated water with elevated blood lead. Neurotoxicology 2000; 21: 1091-1100.
8. Coplan MJ, Patch SC, Masters RD, Bachman MS. Confirmation of and explanations for elevated blood lead and other disorders in children exposed to water disinfection and fluoridation chemicals. NeuroToxicology 28 (2007) 1032–1042

9. Macek MD, Matte TD, Sinks T, Malvitz DM. Blood Lead Concentrations in Children and Method of Water Fluoridation in the United States, 1988–1994 Environ Health Perspect 114:130–134 (2006)
10. Maas RP, Patch SC, Christian A, Coplan MJ. Effects of fluoridation and disinfection agent combinations on lead leaching from leaded-brass parts. NeuroToxicology 28 (2007) 1023–1031

11.6.Source And Purity Of Fluoridation Additives

Several people raised concerns about additives that are used for water fluoridation. For instance, a copy of a resolution passed earlier this year by the Region of Peel was submitted, that asks Health Canada to regulate drinking water fluoridation additives under the Food and Drugs Act. It is important to note that Peel also recently reaffirmed its practice of community water fluoridation. Canada's Minister of Health response, along with Peel's letter, is included in *Appendix N*.

11.6.1. Source

Fluoride is a naturally occurring ion found in rock formations throughout the earth's crust. Water taken from the natural environment contains many ions, including fluoride, due to the rocks and minerals that the water contacts in nature. There is no such thing as artificial fluoride; all fluoride ions are chemically identical, whether found in natural water sources, or in the rocks and minerals which are mined in order to extract the fluoride.

Fluorine is used in aluminum, steel, glass, enamel, brick, tile, pottery, and cement manufacturing; fluorinated chemical and phosphate fertilizer production; and metal casting, welding, and brazing. Sodium fluoride (NaF) is used as a flux for deoxidizing rimmed steel, as a component of laundry sours (removal of iron stains), in casein glues and heat-treating salts, and in the resmelting of aluminum, manufacture of vitreous enamels, pickling of stainless steel, and manufacture of coated papers. Sodium fluoride is also used in various pesticide formulations, including insecticides and wood preservatives.[1]

Most fluoride additives for drinking water are produced from phosphorite rock which is used primarily in the manufacture of phosphate fertilizer. These rocks contain a mineral called apatite which is rich in both fluoride and phosphate, and are typically mined and processed in the U.S., as is the case for Muskoka's fluoride.

References

1. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride. December, 2010.

11.6.2. Manufacturing Process

The rocks are processed by heating them in acid, which produces a phosphoric acid-gypsum (calcium sulfate-CaSO4) slurry, and releases hydrogen fluoride (HF) and silicon tetrafluoride (SiF4) gases. These gases are captured by vacuum evaporators, and condensed to a water-based solution of 23% HFSA with the remainder as water.

HFSA is used for water fluoridation, phosphoric acid is an important ingredient in chemical fertilizer, and gypsum is the material used to form drywall or sheetrock. It has been stated that HFSA is a by-product of fertilizer production; it would be equally valid to state that fertilizer is a by-product of HFSA production, as both phosphorous and fluoride are extracted from the same rocks through the same process. It may be most accurate to state that HFSA and fertilizer are co-products of that process.

Approximately 95% of HFSA used for water fluoridation comes from this process. The remaining 5% is generated during the manufacture of hydrogen fluoride or from the use of hydrogen fluoride in the manufacturing of solar panels and electronics.

It has been suggested that the production of HFSA is a convenient way for the fertilizer industry to dispose of a waste by-product. However, there is no requirement to capture the silicon tetrafluoride gas produced, and the amount of hydrogen fluoride produced by the largest fertilizer producer in the U.S. is below the 25 ton limit set by USEPA. In fact, only about 50% of fertilizer producers recover HFSA; about 65% of the HFSA produced is for water fluoridation and the remaining 35% is used in other industries, primarily in the production of solar panels.[1]

Since the early 1950s, HFSA has been the chief additive used for water fluoridation in the United States, due to its favorable cost and high purity. The two other additives used, sodium fluorosilicate and sodium fluoride, are dry additives that are derived largely from HFSA.

HFSA can be partially neutralized by either table salt (sodium chloride) or caustic soda to get sodium fluorosilicate. If enough caustic soda is added to neutralize the fluorosilicate completely, it results in sodium fluoride. Sodium fluoride is also produced by mixing caustic soda with hydrogen fluoride, although approximately 90% of the sodium fluoride used in the United States comes from HFSA. Sodium fluoride is used in products such as fluoridated toothpastes, mouth rinses, and professionally applied fluoride foams, gels, and varnishes.

References

1. Phone conversation with Kip Duchon, National Fluoridation Engineer, United States Centers for Disease Control
2. http://www.cdc.gov/fluoridation/fact_sheets/engineering/wfadditives.htm

11.6.3. Regulation

As with any substance extracted from the natural environment, natural impurities will exist in the HFSA. Purity standards are therefore imposed before the HFSA can be added to drinking water. “NSF Standard 60: Drinking Water Chemicals - Health Effects” is the MOE mandated standard for fluoridation products. NSF 60 was developed using USEPA and Health Canada criteria to determine that fluoridation products are safe at their maximum use level with respect to potential chemical and radioactive impurities. The NSF 60 Standard is even more stringent than the USP-NF Standard for fluorides used to produce pharmaceuticals. The U.S. Centers for Disease Control and Prevention advise that:

"Some have suggested that pharmaceutical grade fluoride additives should be used for water fluoridation. Pharmaceutical grading standards used in formulating prescription drugs are not appropriate for water fluoridation additives. If applied, those standards could actually increase the amount of impurities as allowed by AWWA and NSF/ANSI in drinking water.

Given the volumes of chemicals used in water fluoridation, a pharmaceutical grade of sodium fluoride for fluoridation could potentially contain much higher levels of arsenic, radionuclides, and regulated heavy metals than a NSF/ANSI Standard 60-certified product." [1]

A Certificate of Analysis is required to be provided with each shipment of hydrofluorosilicic acid, and City staff will be required to review it to ensure that it has been tested to meet the NSF 60 Standard. This method of verification is also used for shipments of other water treatment additives. City staff does not perform independent sampling and testing of shipments of any of these additives but relies on the supplier to provide Certified Analyses. A typical Certificate of Analysis is provided in *Appendix K*.

HFSA is supplied in a concentrated form and, in this form, is a corrosive acid that must be handled with appropriate precautions. Each litre of concentrated HFSA would be mixed into approximately 460,000 litres of water. At this level of dilution, the HFSA molecules become completely dissociated into the ions (predominantly fluoride) that make up HFSA. [2]

It has been suggested that perhaps the ions that formerly made up the HFSA molecules might re-associate in the stomach. For this to happen, the free ions would have to avoid interacting with the multitude of other compounds within the stomach, locate each other, and recombine to form molecules of HFSA. The City is unaware of any studies that suggest this possibility.

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p.22).

References

1. http://www.cdc.gov/fluoridation/fact_sheets/engineering/wfadditives.htm
2. Finney, W.F. et al. Reexamination of Hexafluorosilicate Hydrolysis by 19F NMR and pH Measurement. Environ. Sci. Technol. 2006, 40, 2572-2577

11.6.4. Testing

Several people have stated that HFSA has not had safety studies or toxicology testing for human consumption. HFSA is used for fluoridation worldwide because when it is added to drinking water, it dissociates into its constituent ions and immediately ceases to exist as HFSA. People do not ingest, and are not exposed to HFSA when they drink fluoridated water. This is critical to understand, because when our health agencies assess the safety of fluoridation, they must look at what people are actually consuming. All toxicology studies must be performed on the substances that people are actually exposed to. In the case of water fluoridation, people are exposed to the ions that are released from the HFSA, and also to the natural impurities that exist in the HFSA, but not to HFSA itself.

Health Canada and the U.S. Environmental Protection Agency worked together with NSF International (and others) to create the NSF/ANSI 60 purity standard for all chemicals used to treat drinking water, including those used for fluoridation. NSF 60 includes a process for the toxicological evaluation of all treatment chemicals and for the impurities that they contain. When toxicological limits for a substance have previously been determined by Health Canada or the USEPA, the NSF 60 standard uses these established limits in their assessment. The following wording is found within the NSF/ANSI 60 standard:

"If a substance is regulated under the USEPA's National Primary Drinking Water Regulations and USEPA has finalized a Maximum Contaminant Level (MCL) or other means of regulation such as a treatment technique (see Annex A, section A.2.18), no additional collection of toxicological data shall be required prior to performance of the risk estimation (see Annex A, section A.6.1). Where Health Canada has finalized a Maximum Allowable Concentration (MAC), no additional toxicological evaluation shall be required prior to performance of the risk estimation (see Annex A, section A.6.1). Annex D contains a list of regulatory values (MCL or MAC) and their corresponding SPACs. This list includes consensus evaluation criteria for those substances that are regulated by both countries."

Essentially, this says that where USEPA or Health Canada have already performed toxicological evaluation, the NSF doesn't need to do that same research all over again. Remember, Health Canada and USEPA were partners in developing the NSF 60 standard.

11.6.5. Impurities

When HFSA is added to water, the concentration of fluoride ions is increased, but trace amounts of other elements like lead and arsenic can also be present. The NSF looks to the toxicology studies that Health Canada and the USEPA have performed, and to the maximum limits that they have set for these impurities in water. Using Health Canada's studies, the toxicological evaluation for fluoride in water can be found following this link:

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php

This is the study that was released in 2011. It advises that "The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects". Again, the City of Orillia would fluoridate to a level of 0.7 mg/L, which is less than half the level where Health Canada found no harmful effects.

Similarly for arsenic, the Health Canada report can be found by following this link:

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/arsenic/index-eng.php

Health Canada's lead report can be found at this link:

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/lead-plomb/index-eng.php

These reports, and their USEPA counterparts, are the toxicology studies that we have been told “are missing” or “can’t be found”. If you are asked to show anyone the toxicology studies, you can refer them to the following index for all of these Health Canada evaluations:

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php#guidance

Each evaluation is based upon hundreds of published, referenced scientific research studies. You won’t find HFSA listed, because all researchers understand that HFSA is not present in drinking water – the studies are for the released substances that people are actually exposed to in drinking water. Some people may claim that because HFSA is not on the list, the toxicology studies are missing.

When a product like HFSA is certified as meeting the NSF 60 standard, this means that (among other safeguards) the natural impurities are well within the safety limits. In fact, if we added the HFSA at the maximum allowable concentration (which we wouldn’t) the impurities may not contribute more than 10% of their maximum allowable level. For example, arsenic is the most common impurity that can be detected in HFSA. Health Canada has set a maximum allowable level for arsenic in drinking water of 10 µg/L (micrograms per litre). So the NSF 60 standard requires that if we added HFSA at the maximum allowable level, then the HFSA may not contribute more than 1 µg/L of arsenic to the drinking water (10%).

In February 2008, NSF published data compiled on the level of contaminants found in all fluoridation products that have applied for, or have been listed by, NSF.[1] Levels of arsenic in 57% of these products were non-detectable, even though products are tested at 10 times their maximum use level. All detections were at levels below the allowable concentration, if the product is added to drinking water at (or below) its maximum use level. The highest detection of arsenic from a fluoridation chemical was 0.6 µg/L, and the average concentration was 0.12 µg/L (i.e. approximately 10 times lower than the NSF 60 standard allows, and 100 times lower than Health Canada’s maximum).

References

1. NSF Fact Sheet on Fluoridation Chemicals. www.nsf.org/business/water_distribution/pdf/NSF_Fact_Sheet.pdf

11.7.Legal Liability Considerations

11.7.1. Safe Drinking Water Act Section 19

On December 31, 2012, Section 19 of the Safe Drinking Water Act will be proclaimed into law. Section 19 is commonly referred to as the “the Standard of Care Provision”, and is reproduced below:

Standard of care, municipal drinking water system

19. (1) Each of the persons listed in subsection (2) shall,

(a) exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and

(b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. 2002, c. 32, s. 19 (1).

Same

(2) The following are the persons listed for the purposes of subsection (1):

1. The owner of the municipal drinking water system.
2. If the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation.
3. If the system is owned by a municipality, every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system. 2002, c. 32, s. 19 (2).

Offence

(3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).

Same

(4) A person may be convicted of an offence under this section in respect of a municipal drinking water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4).

Reliance on experts

(5) A person shall not be considered to have failed to carry out a duty described in subsection (1) in any circumstance in which the person relies in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report. 2002, c. 32, s. 19 (5).

With respect to the City of Orillia Water System, the Standard of Care provision will apply to Orillia's Municipal Councilors, including them among those who could be charged with an offence if they fail to exercise their responsibilities toward the operation of the water system in the manner detailed in subsection (1); i.e. to (a) exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and (b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system.

With respect to drinking-water fluoridation, the Director of Public Works has provided this report recommending that Council support the implementation of fluoridation of the City of Orillia's drinking water. This recommendation is based upon recommendations of the World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Simcoe Muskoka District Health Unit. These individuals and organizations have advised that not only does drinking-water fluoridation cause no harm, but that it provides significant oral health benefits.

Subsection (5) explicitly states that no person will be considered to have failed in their duties if they relied in good faith on a report of a person whose professional qualifications lend credibility to the report.

Adapted from: Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012 (p.24).

11.7.2. Professional Engineers Act

The City's Engineers who oversee the water system are held accountable both under Section 19 of the Safe Drinking Water Act, and the Professional Engineers Act. Section 77 of Reg. 941 of the Professional Engineers Act is the Code of Ethics, of which sub-section (1) states:

1. *It is the duty of a practitioner to the public, to the practitioner's employer, to the practitioner's clients, to other members of the practitioner's profession, and to the practitioner to act at all times with,*
    - *i. fairness and loyalty to the practitioner's associates, employers, clients, subordinates and employees,*
    - *ii. fidelity to public needs,*
    - *iii. devotion to high ideals of personal honour and professional integrity,*
    - *iv. knowledge of developments in the area of professional engineering relevant to any services that are undertaken, and*
    - *v. competence in the performance of any professional engineering services that are undertaken.*

Sub-section (2)(i) further requires that:

2. *A practitioner shall,*
    - *i. regard the practitioner's duty to public welfare as paramount*

No concerns are anticipated in the design, implementation and monitoring of fluoridation systems for the City's water system that are safe and reliable, both for City staff and for the public in general.

11.7.3. Status Of Lawsuits

The City of London recently reviewed its practice of fluoridation (See copy of this report in *Appendix L*), including research into Canadian court cases involving fluoridation. An excerpt from London's report is given below:

The issue of informed consent has been raised in several Canadian cases. Generally the issue is framed as whether fluoridation of public water amounts to the administration of a drug without the informed consent of the people being medicated. This is often tied to section 7 of the Charter and the right to life, liberty and security of the person and the right not to be deprived thereof except in accordance with the principles of fundamental justice.

In the 2003 BC case Millership v. British Columbia (affirmed by BC Court of Appeal and leave to appeal to Supreme Court of Canada denied), the plaintiff sought a declaration that public water fluoridation mass medicates and poisons Canadians by the drug fluoride without their informed consent. The court denied the declaration, and in doing so the court determined that the fluoridation of water was done pursuant to the authority of a by-law after a referendum in support of such by-law by the majority of the residents of the community. The court stated that members of a community are able to obtain

information about the fluoridation of water if they wish, and are given an opportunity to debate the issue and take steps to avoid fluoridated water if they wish.

The court also referred to the case Locke v. Calgary (City) where the court found that the by-law did not violate the plaintiff's rights to security of the person, and that in any event such a by-law would be saved by principles of fundamental justice which required a fair balance to be struck between the interests of a person whose claim to security had been violated and those of society. The court in Locke also held that the intrusion by the judiciary into value judgments of the legislature and the electors must be restrained unless there is a clear breach of the Charter established on at least a balance of probabilities by the proponent of such breach.

In addition, the American Dental Association provides the following comments on fluoridation in U.S. courts:

During the last sixty years, the legality of fluoridation in the United States has been thoroughly tested in the courts. Fluoridation is viewed by the courts as a proper means of furthering public health and welfare. No court of last resort has ever determined fluoridation to be unlawful. The highest courts of more than a dozen states have confirmed the constitutionality of fluoridation. Moreover, the U.S. Supreme Court has denied review of fluoridation cases thirteen times, citing that no substantial federal or constitutional questions were involved. (1)

References

1. http://www.ada.org/sections/professionalResources/pdfs/fluoridation_facts.pdf)
2. Drinking Water Fluoridation in London, City of London Report to Chair and Members of the Civic Works Committee Meeting on April 23, 2012, pp.18-19.

12. How Council May Make A Decison

Council may take a "pros and cons" approach to making a decision on fluoridation, weighing the balance of positives and negatives. Comprehensive reviews of all relevant studies have been completed by reputable health agencies around the world that conclude that the weight of evidence is in favour of fluoridation – it is safe, effective, and economical. However, the overwhelming majority of public input received in Orillia has been from individuals who are opposed to fluoridation. It is noted that freedom of choice will be limited for these individuals if fluoridation proceeds.

While the science available strongly supports fluoridation, the response of the citizens of Orillia to the practice must also be considered. Simply put, if the implementation of fluoridation will cause a significant number of people to be seriously upset, or even a select number of people extreme mental duress, then it may not be the right decision.

In addition, members of Council will have to consider how they feel personally. They will need to judge whether they are satisfied with the conclusions of our nation's health experts, or whether the public response is significant enough to warrant going against their advice.

13. Conclusions

The objectives of the public consultation process were to be addressed in addition to answering some key policy questions, as laid out at the beginning of this report. The stated objectives were achieved, as follows:

1. To provide Council with unbiased and factual information about CWF.

One of the primary purposes of this report is to summarize the facts regarding CWF and the main issues that arose during public consultation. This has been completed with the assistance of the SMDHU.

2. To raise the level of awareness about CWF among the citizens of Orillia.

Several initiatives were completed to raise the level of awareness about CWF, with the assistance of the SMDHU. These included: information posted on City and SMDHU websites, presentations to City staff, presentations to community groups, providing information to the media, two public forums on fluoridation, and advertising by SMDHU.

3. To provide an opportunity for citizens of Orillia to hear about and be heard about CWF.

Citizens were given the opportunity to speak publicly at both public forums on fluoridation. These were also an opportunity to hear from health experts on the subject. Citizens were also given opportunities to provide input following each of the public forums.

4. To achieve an open and transparent consultative process that will respect and address the views and concerns of the citizens of Orillia.

The public consultation process was initiated in September 2011 with notice of the first public forum being posted in December 2011. Notices were published in the City Bulletin of the Orillia Packet & Times on December 22, 2011, January 5 and 12, and February 16 and 23, 2012, as well as posted on the City's website. Notice of the second public forum was published in the City Bulletin of the Orillia Packet & Times on April 26 and May 3, 2012 as well as on the City's website. Notices were also to be published on May 10, 17, and 24, 2012. In addition, press releases were issued to local media, and news items were posted on the home page of the City's website. Related media coverage included local newspapers, radio and television. Public input was received for inclusion in this report up until June 15th, 2012.

In addition, the public consultation was to assist in answering key policy questions such as:

- What is the potential health benefit for the Orillia community?

The potential health benefits for the Orillia community are significant. An average reduction in dental decay rates of 20-40% is expected, across the population. The associated general health benefits of improved oral health extend beyond this. More dramatic improvements are expected in particular segments of the population including:

children, seniors, individuals and families with low income, and individuals and families without access to professional dental care.

- What are any potential negative health impacts?

Several systematic reviews of the existing body of research, conducted by credible health experts, all conclude that there is no link between fluoridation and any potential negative health impacts. As referred to earlier in this report, the only proven issue associated with water fluoridation is mild fluorosis which, at the optimal level of fluoridation (as would be the case in Orillia), is very rare and is not a health concern.

- What are the common public views, perceptions and concerns?

Public views, perceptions, and concerns vary widely and include those who:

- Are in favour of fluoridation
- Are not sure whether it is a good idea or not
- Object to fluoridation because it impinges on an individual's freedom of choice
- Believe that fluoridation will bring with it a host of negative health or ecological impacts
- Feel that fluoride is okay in toothpaste, mouth rinses, and at the dentist, but not in the water

- What are the potential costs and benefits to the community?

Updated capital and operating cost budgets have been provided in this report. It is expected that approximately $38 in dental costs will be saved for every $1 spent on fluoridation. The expected health benefits associated with the improvements in overall oral health go beyond this.

- What is the overall degree of public support or opposition?

Some support was received for fluoridation – both from individuals as well as from the local medical and dental community. However, a significant majority of the members of the public that provided input were opposed to fluoridation.

According to the Rapid Risk Factor Surveillance System (RRFSS), a monthly telephone survey conducted by a third party on behalf of health units, 64% of randomly selected adults who reside in Orillia supported adding fluoride to public drinking water. Telephone surveys are more representative than a survey conducted by the media of their audiences.

13.1. Staff Recommendation

THAT Council receive this report for information and APPROVE a resolution stating the following:

WHEREAS Council may by by-law establish, maintain, and operate a fluoridation system in connection with the City of Orillia's waterworks system, as authorized by the Fluoridation Act, and as regulated by the Ministry of the Environment;

WHEREAS at the Global Consultation on Oral Health Through Fluoride (2006), the World Health Organization, the World Dental Federation and the International Association for Dental Research reaffirmed the efficiency, cost-effectiveness, and safety of the daily use of optimal fluoride to prevent dental decay, and confirmed that universal access to fluoride for dental health is a part of the basic human right to health;

WHEREAS the U.S. Centers for Disease Control and Prevention declared fluoridation of drinking water to be one of the ten great public health achievements of the 20th century;

WHEREAS in June of 2011, Health Canada released the results of a multi-year, systematic review of the health risks associated with fluoride in drinking water and concluded that *"The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects…";*

WHEREAS the aforementioned Health Canada review also stated that *"… the optimal concentration of fluoride in drinking water for dental health has been determined to be 0.7 mg/L for communities who wish to fluoridate. This concentration provides optimal dental health benefits and is well below the MAC (Maximum Acceptable Concentration of 1.5 mg/L) to protect against adverse effect"*;

WHEREAS in its April 2009 position statement, the Board of Health for the Simcoe Muskoka District Health Unit concludes that "*optimally fluoridated drinking water should be available to all residents on municipally supplied drinking water systems."*

THEREFORE BE IT RESOLVED THAT the Corporation of the City of Orillia supports the fluoridation of the City of Orillia's drinking water.

THAT a capital budget of $180,000 be established for implementation of fluoridation funded from the Water and Wastewater Reserve.

AND THAT Council Committee consider this report at its July 2012 meeting and that a Council decision on any recommendation from Council Committee be deferred until the August 2012 Council meeting, to allow sufficient time to consider the information provided.

13.2.Time Frame For Implementation

Upon capital budget approval, it is anticipated that implementation of fluoridation of the City's drinking water could be completed within nine to twelve months.

APPENDIX A

PUBLIC CORRESPONDENCE

Debrah Rabbitts

From: Carole Clinch [caclinch@gmail.com]

Sent: Tuesday, May 05, 2009 3:16 PM

To: Debrah Rabbitts; tlauer@sympatico.ca; don_evans@rogers.com; pcvc@sympatico.ca; mfogarty@bell.blackberry.net; buttercup.estate@sympatico.ca; cipolla@encode.com; ffecht@orilliapronet.com

Subject: Public Health Service Research demonstrates that artificial water fluoridation does not prevent cavities - turn it off and save millions

Dear Council

It is curious that the following members of the Public Health continue to state that artificial water fluoridation prevents cavities when their own research demonstrates that it does not prevent cavities.

***Azarpazhooh A, Stewart H. Oral Health Consequences of the Cessation of Water Fluoridation in Toronto 2006* August.**

- The above meta-analysis authored by the ***Chief Dental Officer for Toronto, Dr. Hazel Stewart*** demonstrates that cavity rates remained the same or continued to decline in communities which discontinued artificial water fluoridation.

Ito D, President of Ontario Association of Public Health Dentistry. Determinants of caries in adjacent fluoridated and non-fluoridated cities. IADR/AADR/CADR 85th General Session and Exhibition March 21-24, 2007 # 2757.

- We found virtually no difference in caries prevalence or severity between 7-year-old children from schools in non-fluoridated Caledon and schools matched on socio-economic factors, in fluoridated Brampton.

Maupome G, Clark DC, Levy SM, Berkowitz. Patterns of dental caries following the cessation of water fluoridation. Community Dent Oral Epidemiol 2001; 29:37-47

- The prevalence of caries (assessed in 5,927 children, grades 2, 3, 8, 9) decreased over time in the fluoridation-ended community while remaining unchanged in the fluoridated community. (British Columbia)

If this recent research evidence from members of the Canadian Public Health Service is correct, artificial water fluoridation is a significant waste of taxpayers' money.

Do you have better ways of spending this money?

Carole Clinch

Research Coordinator - People for Safe Drinking Water

Item # 1

Debrah Rabbitts

From: Peter Van Caulart [etipvc@gmail.com] on behalf of P [etivc@iaw.on.ca]
Sent: Thursday, May 07, 2009 3:54 PM
To: jfecht@orilliapronet.com; Debrah Rabbitts; cipolla@encode.com; buttercup.estate@sympatico.ca; mfogarty@bell.blackberry.net; pcvc@sympatico.ca; don_evans@rogers.com; tlauer@sympatico.ca
Subject: Fluoridation forum

Dear Mayor and Council of Orillia:

I've read in the Packet & Times "Council Briefs" section that you have decided to hold a public fluoridation forum. No doubt the request to do so has come from outside interests. I ask that when a forum is planned that myself or my associates are listed to speak to the issue of keeping Orillia's drinking water as pure as possible without the addition of waste silicofluoride compounds in the guise of fluoridation.

For almost five years I have actively educated water engineers and operators about the reasons to abandon unrequired infrastructure. Artificial water fluoridation degrades water quality and no longer is sustainable.

Since 2000 in Ontario, communities have developed a strong technical basis for operating water supplies competently and effectively. Past practices have evolved to produce drinking water of the highest quality while controlling costs and environmental impacts.

This topic can be fully referenced by visiting fluoridealert.org or waterloowatch.com websites.

Sincerely,

Peter Van Caulart, Director
Environmental Training Institute.
905 892-1177

Item 6

Ministry of Health and Long-Term Care

Chief Medical Officer of Health

Public Health Division
11th Floor, Hepburn Block
Queen's Park
Toronto ON M7A 1R3

Telephone: (416) 212-3831
Facsimile: (416) 325-8412

Ministère de la Santé et des Soins de longue durée

Médecin hygiéniste en chef

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Édifice Hepburn, 11e étage
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Ontario

June 13, 2011

City of Orillia
50 Andrew Street South, Suite 300
Orillia, Ontario
L3V 7T5

Mayor and Members of Council:

As a community that has not previously fluoridated its water, I would like to take this opportunity to commend you for considering this important public health measure. Over 70 percent of Ontarians currently have access to fluoridated drinking water, and it is important that Orillia contribute to this statistic so that your residents can enjoy the lasting health benefits.

The value of water fluoridation should not be underestimated. As tooth decay is the single most common chronic disease among Canadians of all ages, and poor oral health is linked to diabetes, heart disease and respiratory conditions, water fluoridation is an extremely important public health measure. In fact, water fluoridation has been called one of the greatest public health achievements of the 20th century by the U.S. Centers for Disease Control and Prevention (CDC).

The benefits of water fluoridation are well documented. Even with other sources of fluoride available today, fluoridated water still has an impact on reducing the rates of tooth decay not only in children, but adults and seniors as well. In fact, the American Dental Association estimates that water fluoridation continues to be effective in reducing tooth decay by 20-40%.

When you consider that local surveillance conducted by the Simcoe Muskoka District Health Unit reveals that elementary school children in Orillia have 54% higher decay rates than elementary school children in fluoridated areas of Simcoe Muskoka, adding fluoride to your drinking water has the real potential to reduce the rates of tooth decay in your community and therefore improve the health of your population.

Adding fluoride to your water will also benefit those least able to afford or access dental treatment. In fact, the health benefits of water fluoridation extend to all residents in a community, regardless of age, socioeconomic status, education or employment.

From a cost perspective, the fluoridation of drinking water is an inexpensive way to improve oral health and has the capacity to help reduce dental care expenditures. The Ontario Dental Association has stated that the cost of waiting until tooth decay has manifested is significantly

higher than the cost of preventing it in the first place, and the CDC estimates $38 in avoided costs for dental treatment for every $1 invested in water fluoridation.

You also should rest assured that fluoridated water is safe. In Ontario, fluoride additives are required to meet rigorous standards of quality and purity before they can be used.

When they are added to water at levels recommended in Ontario and across the country, studies have not linked fluoride to adverse health effects such as cancer, bone fractures or intelligence levels.

Once again, I would like to commend you for considering adding fluoride to your community's water. I am confident that once you have heard from the experts, you will make the right decision and commence fluoridating Orillia's water.

Sincerely,

Arlene King, MD, MHSc, FRCPC
Chief Medical Officer of Health

cc: Dr. Charles Gardner, Medical Officer of Health and Chief Executive Officer, Simcoe Muskoka District Health Unit
Peter Dance, Director of Public Works, City of Orillia

HLTC

News Release Communiqué

DRINKING WATER FLUORIDATION
STATEMENT FROM DR. ARLENE KING, CHIEF MEDICAL OFFICER OF HEALTH

NEWS April 4, 2011

As Chief Medical Officer of Health for Ontario, I am very concerned about the loss of fluoridated drinking water in certain communities in spite of consistent evidence that water fluoridation is safe and effective.

Support for Water Fluoridation

More than 90 national and international professional health organizations, including Health Canada, the Canadian Public Health Association, the Public Health Agency of Canada, the Canadian Dental Association, the Canadian Medical Association, the U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization, have endorsed the use of fluoride at recommended levels to prevent tooth decay.

In fact, the use of fluoride in drinking water has been called one of the greatest public health achievements of the 20th century by the CDC.

Benefits of Water Fluoridation

Combats Tooth Decay

The benefits of water fluoridation are well documented. According to expert research, fluoridated drinking water reduces the number of cavities in children's teeth, which contributes to their healthy development. Reductions of tooth decay have also been observed in adults and seniors who reside in communities with fluoridated water. Even with other sources of fluoride available today, the American Dental Association estimates that water fluoridation continues to be effective in reducing tooth decay by 20-40 per cent.

Conversely, removing fluoride from drinking water systems has the potential to contribute to increased rates of tooth decay. The findings of several studies, including from the CDC, suggest that tooth decay generally increases in a population after water fluoridation is discontinued. In addition, a 2007 report on water fluoridation by the Institut National de Santé Publique du Quebec reveals that the percentage of kindergarten children at high risk of developing tooth decay in Dorval, Quebec doubled in the two year period after water fluoridation was halted in 2003.

Reduces Dental Care Expenditures and Inequalities in Health

Water fluoridation also has the capacity to help reduce dental care expenditures. The Ontario Dental Association has stated that the cost of waiting until tooth decay has manifested is significantly higher than the cost of preventing it in the first place. The CDC estimates $38 in avoided costs for dental treatment for every $1 invested in community water fluoridation. With the fluoridation of drinking water playing an important role in the overall promotion of good oral health and prevention of dental decay, I am concerned that removing it from drinking water may put a strain on, and impact the success of, important provincial programs such as the Children in Need of Treatment Program and Healthy Smiles Ontario - both developed to benefit those least able to afford dental services.

And indeed, removing fluoride from drinking water will place those least able to afford or access dental treatment at an increased risk for oral health problems. The health benefits of drinking water fluoridation extend to all residents in a community, regardless of age, socioeconomic status, education or employment.

Safety of Fluoridated Drinking Water

Fluoride in drinking water is also safe. In Ontario, fluoride additives are required to meet rigorous standards of quality and purity before they can be used. When they are added to water at levels recommended in Ontario and across the country, studies have not linked fluoride to cancer, bone fractures or intelligence levels. Studies have also found that water fluoridation is safe for the environment, and poses no risk to plants and animals.

In addition, most dental fluorosis, a condition that occurs when a child receives too much fluoride during tooth development, is mild and appears as white stains on the teeth. In this mildest form, fluorosis may affect the look of a tooth, but will not affect its function. While moderate or severe fluorosis does occur, the Canadian Health Measures Survey: Oral Health Statistics 2007-2009 concludes that, "[so] few Canadian children have moderate or severe fluorosis that, even combined, the prevalence is too low to permit reporting. This finding provides validation that dental fluorosis remains an issue of low concern in this country."

Good Oral Health Means Good Overall Health

The importance of maintaining good oral health should not be taken lightly - it is an important part of being healthy overall. As tooth decay is the single most common chronic disease among Canadians of all ages and poor oral health is linked to diabetes, heart disease and respiratory conditions, water fluoridation is, and must be recognized as, a very important public health measure.

An estimated 70 per cent of Ontarians currently have access to water that is fluoridated, and I would urge all Ontarians to continue to support the fluoridation of their municipal drinking water systems so that everyone can enjoy the lasting health benefits.

Media Contact:
Julie Rosenberg, Ministry of Health Promotion and Sport, 416-326-4833

From: Carole Clinch [mailto:caclinch@gmail.com]
Sent: Wednesday, June 22, 2011 12:38 PM
To: MAYOR EMAIL; Don Jenkins; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Fluoride

June 22, 2011

Dear Orillia Council

The scientific/legal determination of safety is based on 2 types of research:

1. Animal studies (toxicology studies)
2. Human studies (clinical trials, epidemiology studies)

The actual fluoride products used in artificial water fluoridation (silicofluorides Na2SiF6, H2SiF6) have neither the required animal studies (toxicology studies) nor the required human studies (randomized controlled clinical trials) to determine safety. Attached is documentation of the evidence.

In the absence of these safety studies, any claims that these products are "safe" are not based on well-established scientific protocols.

In the absence of these safety studies, any claims that these products are "safe" are not based on legal definitions and requirements as defined in various Canadian laws and regulations.

A formal complaint was filed with the Auditor General of Canada on May 26, 2011 regarding the unregulated, unsafe, illegal fluoride products used in artificial water fluoridation.

Executive Summary available from:
http://www.newmediaexplorer.org/chris/Canada_Request_for_Audit_2011_Executive_Summary.pdf

It is interesting to note that the organizations which promote artificial water fluoridation accept no responsibility for the safety of this policy:

Who Claims Responsibility for Safety?

Everyone agrees that municipalities are responsible for the safety of Canadian citizens because municipalities decide to fluoridate, choose the fluoride products, buy the fluoride products, and put the fluoride products into the drinking water.

We are willing to meet with your legal experts to discuss these legal concerns if you wish.

Carole Clinch
307 Normandy Ave
Waterloo, Ontario, Canada N2K 1X6
519-884-8184

Clinch CA. Fluoride Interactions with Iodine and Iodide: Implications for Breast Health. Fluoride April-June 2009:42(2):75-87.
http://www.fluorideresearch.org/422/files/FJ2009_v42_n2_p00i-iii.pdf

Long H, Jin Y, Lin M, Sun Y, Zhang L, Clinch C. Fluoride Toxicity in the Male Reproductive System. Fluoride Oct-Dec 2009;42(4):275-291.
http://www.fluorideresearch.org/424/424/files/FJ2009_v42_n4_p260-276.pdf

Clinch CA. Does Dental Fluoride Use have Clinically Significant Effects on Oral Bacteria? Fluoride Oct-Dec 2010;43(4):213-22.
http://www.fluorideresearch.org/434/files/FJ2010_v43_n4_p205-214.pdf

Clinch CA. Excess Fluoride Interference with Cystic Fibrosis Transmembrane Conductance Regulator (CFTR). Fluoride Jan-Mar 2011;44(1):7-8.
http://www.fluorideresearch.org/441/files/FJ2011_v44_n1_p007-008_pq.pdf

Absence of Safety Studies of the Fluoride Products used in Artificial Water Fluoridation

prepared by
Carole Clinch BA, BPHE

The scientific/legal determination of safety is based on 2 types of research:

1. Animal studies (toxicology studies)
2. Human studies (randomized, controlled clinical trials are the gold standard)

The actual fluoride products used in artificial water fluoridation (silicofluorides Na_2SiF_6, H_2SiF_6) have neither the required animal studies nor the required human studies to demonstrate safety. Until 2010 there were NO TOXICOLOGY STUDIES available which examined the long-term use of these products. There are now available two (2) recently published toxicological studies [1,2] demonstrating health harm from the long-term use of these products.

The actual fluoride products used in artificial water fluoridation (silicofluorides Na_2SiF_6, H_2SiF_6) is used as a "medical treatment to prevent disease" according to Health Canada, yet it has never been regulated or approved by Health Canada. All other fluoride products used for dental care are regulated under the regulations of the *Food and Drugs Act*. Please see: http://www.newmediaexplorer.org/chris/Clinch_2011_Health_Canada_Downloads_Responsibility_Safety.pdf

> "Health Canada does not regulate hexafluorosilic acid or sodium silicofluoride products, the actual products used in water fluoridation, which are allegedly used as a medical treatment to prevent dental disease." Petition #299, Answer #3, to Auditor General of Canada

In the absence of any studies demonstrating safety, but the availability of 2 recent toxicology studies (see footnotes 1 and 2 and discussion below) showing health harm, any claims that these products are "safe" are not based on well-established scientific protocols or the available evidence.

In the absence of any studies demonstrating safety, any claims that these products are "safe" are not based on legal definitions and requirements as defined in various laws and regulations.

In the absence of any government regulation or approval of these products, any claims that these products are "safe" are not based on fundamental regulatory requirements used to protect public safety.

Foli v MWD SoCal 2011

Several court cases have been filed in the U.S.A. this year based on this evidence. For example, the latest was filed with the Supreme Court of California, U.S.A. in August 2011:

1. Leite GAS, Sawan GMM, Teofilo JM, Port IM, Sousa FB, Gerlach RF. Exposure to lead exacerbates dental fluorosis. Archives of Oral Biology 2011, doi:10.1016/j.archoralbio.2010.12.011

2. Sawan RM, Leite GA, Saraiva MC, Barbosa F, Tanus-Santos JE, Gerlach RF. Fluoride increases lead concentrations in whole blood and in calcified tissues from lead-exposed rats. Toxicology 2010;271(1-2):21-6. http://www.ncbi.nlm.nih.gov/pubmed/20188782

http://fluoride-class-action.com/wp-content/uploads/Foli-v-metropolitan-water-district-of-southern-california-11CV1765-JLS-5373546-0-9893.pdf
Bolen Report
http://www.bolenreport.com/feature_articles/Guest/Green/water%20wholesaler%20sued.htm

> "This case does not challenge the public policy of fluoridation," states Kyle Nordrehaug, attorney for the Plaintiffs. "It does challenge MWD's [municipalities] bait and switch tactics of orchestrating statements by them and their down-line distributors of water to individual consumers when MWD [municipalities] knew that the actual drug product that they deliver had never had a toxicological study performed on the health and behavioral effects of its continued use until 2010, much less approval for MWD's [municipalities, Public Health Service, Health Canada] perpetuation of absolute health claims." [comments added to quote]
>
> "This lawsuit pushes past the rhetoric and reliance on unaccountable endorsements or opinions that usually accompany this subject, and focuses on whether MWD of SoCal [municipalities] adds hydrofluosilicic acid to public drinking water in order to treat or prevent dental disease, and whether FDA [Health Canada] regulates products intended to treat disease, or not," said Jeff Green, National Director of Citizens for Safe Drinking Water and spokesperson for the Plaintiffs.
>
> "In essence," continued Green, "the Plaintiffs are saying, 'Don't tell us, or the media, or the court how safe it is. Go tell it to the FDA [Health Canada] through the evaluation process and get approval for the claims for the specific product you deliver, and don't administer it to us topically, systemically through our ingestion, or through our skin from our baths and showers, without our consent until you do.'"

NO MEANS NO
NO government approval = NOT SAFE
NO safety studies = NOT SAFE
NO safety studies = NOT LEGAL

A. National Sanitation Foundation (NSF) Standard 60

A.1. NSF Standard 60 requires Product Review Data

A key general requirement of ANSI/NSF Standard 60 that applies to all direct water additives is General Requirement, Section 3.2.1, which establishes Product Review Data that must be submitted by the manufacturer for each product in order to be certified as having met the Standard. The standard stipulates that this submission is then used to determine the details of further testing and assessment requirements, as follows:

> A proposed maximum use level for the product; b) the composition of the formulation (in percent or parts by weight for each chemical in the formulation); c) the reaction mixture used to manufacture the chemical, if applicable; d) chemical abstract number (CAS number), chemical name, and supplier for each chemical present in the formulation; e) a list of known or suspected impurities within the treatment chemical formulation and the maximum percent or parts by weight of each impurity; f) a description or classification of the process in which the treatment chemical is manufactured, handled and packaged; g) any selected spectra (e.g. UV/visible, infrared) that has been required; and h) a list of published and unpublished toxicological studies relevant to the treatment chemical and the chemical and impurities present in the treatment chemical.

Of special importance in this General Requirement is that a manufacturer shall submit a list of the product components and known or suspected impurities within the treatment chemical formulation, providing the maximum percent or parts by weight of each impurity, as well as a list of toxicological data, both published and unpublished if available, on the manufacturer's product, and all of its components and contaminants.

Access to full disclosure of product content and impurities is essential to the water operator who is committed to complying with the American Water Works Association standards for specific products. A relevant example is the AWWA standard for the most widely used fluoridation chemical, hydrofluosilicic acid: AWWA B703 Requirement Section 4.3.1 Impurities, General:

> "The fluorososilicic acid supplied according to this standard shall contain no minerals or organic substances in quantities capable of producing deleterious or injurious effects on the health of those consuming water that has been properly treated with fluorosilicic acid."

Manufacturer's Safety Data Sheets (MSDS) and **Certificates of Analysis** are **NOT a viable** substitute for the manufacturer's own declaration in the form of Product Review Data, as they do not cover the essential details.

One element of section 3.2.1. is the requirement of the manufacturer to provide "when available, a list of all toxicological studies published or unpublished relevant to the treatment chemical and the chemicals and impurities present in the treatment chemical." Two recent **toxicology studies** (footnotes 1 & 2 above) demonstrate health harm from long-term use.

The Sawan et al. 2010 study describes an increase in the lead levels in blood, bone and other calcium-

rich tissues, when lead is present with hydrofluorosilicic acid. The significance of the Sawan study is the scientific confirmation of epidemiological studies of a combined 400,000 children (Masters and Coplan, 1999, 2000; Coplan, 2007), showing that the presence of hydrofluorosilicic acid is correlated with an increase in the average of lead in children's blood, and increase in the incidence of the danger level of lead in children's blood, and an effect on Hispanic and African-American children 4 and 7 times more, respectively, than the average. These increases were shown in comparison to the presence of sodium fluoride, as well as no added fluoride.

The Leite et al 2011 study, published in the peer-reviewed journal Archives of Oral Biology, demonstrates that the presence of lead and hydrofluorosilicic acid combined, significantly increases both the incidence and the severity of dental fluorosis over either agent separately.

A failure of all NSF "certified" manufacturers, distributers, vendors, and repackagers, to disclose the existence of these 2 studies, which show health harm from the long-term (chronic) use of fluorosilicates, is contrary to the requirements of the Standard.

A.2. NSF Standard 60 requires Toxicological studies to determine safety

> "The NSF standard requires that the chemicals added to drinking water, as well as any impurities in the chemicals, be supported by toxicological evaluation."
> *Source: Hazan S. 2000. Letter from Stan Hazan, General Manager, Drinking Water Additives Certification Program, NSF International; to Mr. Juan (Pepe) Menedez, State of Florida, Department of Public Health, Tallahassee FL. April 24. Available from: http://www.fluoridealert.org/NSF-Letter.pdf*

> "Standard 60 … requires a toxicology review to determine that the product is safe at its maximum use level and to evaluate potential contaminants in the product. … A toxicology evaluation of test results is required to determine if any contaminant concentrations have the potential to cause adverse human health effects. … NSF also requires annual testing and toxicological evaluation …. The NSF standard requires … toxicological evaluation."
> Source: NSF 2008 Fact Sheet on fluoridation products. Available from: http://fluoride-class-action.com/wp-content/uploads/NSF-fact-sheet-on-fluoride-2008.pdf

> "Basically, all available data on all aspects of toxicity are required to be included in the [toxicological] review eg. Acute toxicity (1-14 day exposure), subacute, subchronic, chronic, reproductive toxicity, developmental toxicity, immunotoxicity, neurotoxicity, genetic toxicity and human data."
> *Source: The National Health and Medical Research Council of Australia Review from 2003 describes the "minimum data requirements" for a chemical/contaminant risk assessment. Drew R, Frangor J. 2003 Overview of National and International Guidelines and Recommendations on the Assessment and Approval of Chemicals used in the Treatment of Drinking Water. A report prepared for the National Health and Medical Research Council's Drinking Water Treatment Chemicals Working Part, Commonwealth of Australia, by Toxikos Pty Ltd. Section 7.5.4 Risk Assessment, page 44.*
> *http://www.google.ca/url?sa=t&source=web&cd=1&ved=0CBUQFjAA&url=http%3A%2F%2Fwww.nhmrc.gov.au%2F_files_nhmrc%2Ffile%2Fpublications%2Fsynopses*

%2Fwatergde.pdf&rct=j&q=Basically%2C%20all%20available%20data%20on%20all%20aspects%20of%20toxicity%20are%20required%20to%20be%20included%20in%20the%20review%20eg.%20Acute%20toxicity%20(1-14%20day%20exposure)%2C%20subacute%2C%20subchronic%2C%20chronic%2C%20reproductive%20toxicity%2C%20developmental%20toxicity%2C%20immunotoxicity%2C%20neurotoxicity%2C%20genetic%20toxicity%20and%20human%20data.&ei=9H9mTbyHJMi2tgfZ7LXmAw&usg=AFQjCNELoYtuyhYlcynKl1FjZlkGjApCMQ&cad=rja"

Health Canada

"The [NSF] standard requires a toxicology review to determine that the product is safe..."
Source: Petition #221 answer #3 and #35: Available from: http://www.oag-bvg.gc.ca/internet/English/pet_lp_e_938.html

A.3. NSF Standard 60 is a "Prescribed Standard"

Toxicology studies for fluoridation products are required for compliance with NSF Standard 60. Most provinces/territories (9 of 13), including Ontario, Northwest Territories, Alberta, Saskatchewan, Manitoba, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador, have elected to adopt NSF Standard 60 as a legal requirement for products added to drinking water.

Survey of ASDWA Members Use of NSF Standards and ETV Reports, March 2010:
http://www.google.ca/url?sa=t&source=web&cd=1&sqi=2&ved=0CCMQFjAA&url=http%3A%2F%2Fwww.nsf.org%2Finfo%2Fasdwasurvey%2F&rct=j&q=Northwest%20Territories%20-%20NSF%20Standard%2060&ei=ZGRxTsbuKKGosAKZsNCNCQ&usg=AFQjCNEjWjWlm8skb6B0cqmL9tIOz9vBvA&cad=rja

"NSF/ANSI Standard 60: 47 states and 9 provinces/territories have legislation, regulations or policies requiring or recommending drinking water treatment chemicals to comply with NSF/ANSI Standard 60." (see figure 1, page 1 for USA survey results and figure C-1, page 9 for Canada survey results)
p9
"9 of 13 Provinces/Territories require drinking water treatment chemicals to comply with the requirements of NSF/ANSI Standard 60". Yukon Territory, Nunavut, British Columbia, PEI do not require NSF Standard 60. (see Figure C-1)

Ontario

"[n]o person shall cause or permit any thing to enter a drinking-water system if it could result in … a contravention of a prescribed standard". [emphasis added]
Source: SDWA 21(1)(b)

"All chemicals and materials used in the alteration or operation of the drinking water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards

Institute ("ANSI") safety criteria standards NSF/60 and NSF/61-" [emphasis added]
Source: Municipal Drinking Water Licenses (MDWL), Schedule B, Section 14, outline the standards required under SDWA 31(1)

Quebec

"Nul ne peut utiliser, pour le traitement de l'eau destinée à la consommation humaine, un produit chimique qui n'est pas certifié conforme à la la norme ANSI/NSF Standard 60, intitulée «Drinking Water Treatment Chemicals B Health Effects»" Règlement sur la qualité de l'eau potable, Loi sur la qualité de l'environnement, section 9.2.
http://www.google.ca/url?sa=t&source=web&cd=1&ved=0CBcQFjAA&url=http%3A%2F%2Fwww.mddep.gouv.qc.ca%2Feau%2Fpotable%2Freglement%2Frqep-refondu.pdf&rct=j&q=Nul%20ne%20peut%20utiliser%2C%20pour%20le%20traitement%20de%20l%E2%80%99eau%20destin%C3%A9e%20%C3%A0%20la%20%20consommation%20humaine%2C%20un%20produit%20chimique%20qui%20n%E2%80%99est%20pas%20certifi%C3%A9%20conforme%20%C3%A0%20la%20%20la%20norme%20ANSI%2FNSF%20Standard%2060%2C%20intitul%C3%A9e%20%C2%AB%20Drinking%20Water%20Treatment%20%20Chemicals%20B%20Health%20Effects%20%C2%BB%20publi%C3%A9e%20par%20l%E2%80%99organisme%20am%C3%A9ricain%20NSF%20%20International%20et%20par%20l%E2%80%99American%20National%20Standards%20Institute.&ei=oORoTrKeOsPbgQeg14TrDA&usg=AFQjCNETPSwf08bpJeGVSx4DqWqHIBfXVw&cad=rja

Alberta

"Any treatment chemicals added to a waterworks system must meet the National Sanitation Foundation (NSF) Standard 60 or be authorized by the Director."
Guide to Requirements for a Waterworks System Consisting only of a Distribution System:
http://www.google.ca/url?sa=t&source=web&cd=13&ved=0CCcQFjACOAo&url=http%3A%2F%2Fenvironment.gov.ab.ca%2Finfo%2Flibrary%2F6998.pdf&rct=j&q=Alberta%20NSF%20Standard%2060&ei=U0SsTbPDBpCC0QHHten5CA&usg=AFQjCNF_9n4FWgJbpuPI5_ADq-7MVpw-OQ&cad=rja

Saskatchewan

A Guide to Waterworks Design (Saskatchewan Environment 2002)

Manitoba

Chlorine and Alternative Disinfectants Guidance Manual 2005, page 2-3

http://www.google.ca/url?sa=t&source=web&cd=3&sqi=2&ved=0CDIQFjAC&url=http%3A%2F%2Fwww.gov.mb.ca%2Fwaterstewardship%2Fodw%2Freg-info%2Fapprovals

%2Fodw_chlorine_and_alternative_disinfectants.pdf&rct=j&q=Manitoba%20Recommended%20Standards%20for%20Water%20Works&ei=h_trTpH9CsqtgQf_08HXBQ&usg=AFQjCNFzWw6E_9gA3MDANh74lkA7LgSE2Q&cad=rja

2.1.5 Manitoba
"The Office of Drinking Water applies the Recommended Standards for Water Works (GLUMRB 2003) or the Ten State Standards developed by the Great Lakes - Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers for water system design, AWWA standards, and best practices."

The Drinking Water Safety Act 2004 C.C.S.M. c. D101
http://web2.gov.mb.ca/laws/statutes/ccsm/d101e.php?query=search

section. 3: Every public water supplier and semi-public water supplier must comply with the drinking water quality standards specified in the regulations.

Ten States: Recommended Standards for Water Works 2007 Edition, Part 5 – Chemical Application
http://www.google.ca/url?sa=t&source=web&cd=4&sqi=2&ved=0CDgQFjAD&url=http%3A%2F%2Fwww.forceflow.com%2Fmedia%2Fregs%2F10StatesWTP2007.pdf&rct=j&q=Recommended%20Standards%20for%20Water%20Works&ei=m_trTuTKINGugQeIuuSFBg&usg=AFQjCNHMZb0bg4_o9BrekkoTj_CHiBbSpg&cad=rja

5.2.2 Specifications: Chemicals shall meet the appropriate ANSI/AWWA standards and/or ANSI/NSF Standard 60.

Atlantic Provinces

Atlantic Canada Guidelines for the Supply, Treatment, Storage, Distribution and Operation of Dirnking Water Supply Systems. Coordinated by the Atlantic Canada Water Works Association (ACWWA) in association with the four Atlantic Canada Provinces. Sept 2004.
http://www.google.ca/url?sa=t&source=web&cd=5&sqi=2&ved=0CEUQFjAE&url=http%3A%2F%2Fwww.gov.ns.ca%2Fnse%2Fwater%2Fdocs%2FWaterSystemGuidelines.pdf&rct=j&q=new%20brunswick%20drinking%20water%20guidelines%20NSF%20Standard%2060&ei=HF1xTsL-MqK0sQKB1c3-CQ&usg=AFQjCNEGHfbRwn6_nC6mLgQGBpfk7myvcA&cad=rja

4.10.2 Artificial Fluoridation
"Where artificial fluoridation is provided, a dosage (This is incorrect- 0.8 mg/L is a concentration) of 0.8 mg/L of fluoride is recommended and should not exceed 1.0 mg/L. Sodium fluoride, sodium silicofluoride and fluorosilicic acid may be used for fluoridation and should meet the applicable AWWA and **NSF standards**."

First Nations

Protocol for Decentralised Water and Wastewater Systems in First Nations Communities. By Aboriginal Affairs and Northern Development Canada, February 2010.
http://www.google.ca/url?sa=t&source=web&cd=7&sqi=2&ved=0CE4QFjAG&url=http%3A%2F%2Fwww.ainc-inac.gc.ca%2Fenr%2Fwtr%2Fdsp%2Fdsp-eng.asp&rct=j&q=Northwest%20Territories%20drinking%20water%20guidelines%20NSF%20Standard

%2060&ei=B2JxTo2MF4eIsQKY1bDbCQ&usg=AFQjCNHy3ELore9hLE5HcM5u5iqoYRmAOw&cad=rja

> "Health-based standards have been designed to safeguard drinking water by helping to ensure the material safety and performance of products that come into contact with drinking water. These types of standards are primarily developed by NSF Interntional/American National Standards Institute, and include: **NSF 60** – Drinking water treatment additives – Health effects"

Guidelines for the Review of Water and Wastewater Project Proposals in First Nations Communities South of 60○: http://www.google.ca/url?sa=t&source=web&cd=9&sqi=2&ved=0CF8QFjAI&url=http%3A%2F%2Fdsp-psd.pwgsc.gc.ca%2Fcollection_2008%2Fhc-sc%2FH34-169-2007E.pdf&rct=j&q=Manitoba%20-%20NSF%20Standard%2060&ei=IvdrTvElgfXSAaql4PIE&usg=AFQjCNEPmiEZjO3UjLma1J1mzzMxk-MULA&cad=rja

> List of Relevant Guidelines and Standards
> 10. National Sanitation Foundation (NSF)
> NSF Standard 60-Drinking Water Treatment Chemicals, Health Effects

B. NSF strays from published requirements/certifies without compliance

Lack of any toxicological studies assures claims of safety are not supportable. Lack of product reviews assures lack of compliance with standard.

There is not even one toxicological study demonstrating safety on the health or behavioral effects of continued use of hydrofluosilicic acid or sodium silicofluoride, with or without contaminants; and certainly not in combination with chloramines, where the two are paired to separate lead from brass.

The use of Certificates of Analysis, MSDS sheets, or the Single Product Allowable Concentration (SPAC) of 10% of the Maximum Acceptable Concentration (MAC) of a contaminant, instead of the standard requirement for Product Reviews, does not satisfy the published requirements for NSF Standard 60.

The use of an arbitrary SPAC (10% of Maximum Acceptable Concentration (MAC) of a contaminant) instead of a Product Review, is in conflict with the published standard (Section 3.2.1.). The MAC is not intended for use in determining the safety of a product. MAC's are negotiated to consider the costs and methodology of contaminant removal from source water. Please see discussion: http://www.newmediaexplorer.org/chris/Clinch_2011_Drinking_Water_Guidelines-Not_Worth_Paper_Written_On.pdf

B.1. Health Canada response in Petition #221 to Auditor General of Canada available from: http://www.oag-bvg.gc.ca/internet/English/pet_lp_e_938.html

> "Health Canada has not conducted toxicology studies on fluorosilicates."

Petitioner asked for “toxicology studies demonstrating safety of the fluorosilicate products used to fluoridate drinking water”. Health Canada response: “A review of the toxicological literature on Sodium Hexafluorosilicate and on Fluorosilicic Acid conducted for the National Institute of Environmental Health Sciences.”

B.2. National Institute Environmental Health Sciences 2001 Review shows that the toxicology studies required for NSF Standard 60 have not been done

> 9.1.4 Short-term and Subchronic Exposure: No data were available.
> 9.1.5 Chronic Exposure: No data were available.
> 9.1.7 Cytotoxicity: No data were available.
> 9.2 Reproductive and Teratological Effects: No data were available.
> 9.3 Carcinogenicity: No studies with sodium hexafluorosilicate or fluorosilicic acid were available.
> 9.4 Initiation/Promotion Studies: No data were available.
> 9.5 Anticarcinogenicity: No data were available.
> 9.7 Cogenotoxicity: No data were available.
> 9.8 Antigenotoxicity: No data were available.

B.3. Quebec Minister of Health and Social Services, Claude Lamarre, Freedom of Information response:

> translation “No toxicology studies or toxicological evaluations on the chronic effects of fluoride products, which are required for [NSF] Standard 60 for each of the fluoridation products are available.”
> «Nous avons bien reçu votre demande d’accès pour recevoir copie des documents suivants; Ø [...] les études toxicologiques ou les évaluations toxicologiques sur l’exposition chronique effectuées sur les agents de fluoruration qui sont requises pour l’obtention du Standard 60 pour chacun des agents de fluoruration [...];
> *Source: Ministère de la Santé et des services sociaux (Monsieur Claude Lamarre) à la demande d’accès à l’information portant le N/Réf.: 1847 00/2010-2011.281*

B.4. National Sanitation Foundation General Manager, Drinking Water Additives Certification Program, Stan Hazan, deposition in 2004:

> “NSF failed to follow its own Standard 60 procedures”
>
> “I would say that the HFSA submissions have not come with the tox studies referenced.”
>
> QUESTION OF ATTORNEY: “Does NSF International do any testing to establish the efficacy of the fluoride-bearing compound for purposes of treating dental health or dental caries?”
>
> “Not that I am aware of.”

B.5. NSF International letter to Honorable Ken Calvert, Chairman Subcommittee on Energy and the Environment, Committee on Science, U.S. House of Representatives dated July 7, 2000

> "There have not been any studies on hydrofluosilicic acid or silicofluorides submitted to NSF under claimed Confidential Business Information protection."

B.6. National Sanitation Foundation letter to Dr. Bill Osmunson, DDS, MPH, 2/1/2007.

> "The NSF International does not evaluate safety of the chemicals added to water for the purpose of the treatment or mitigation of disease in humans, and does not evaluate the product added to water but only the impurities within the product."

B.7. U.S. Environmental Protection Agency (EPA)

US EPA letter by Robert C. Thurnau, Chief, Treatment Technology Evaluation Branch, Water Supply and Water Resources Division dated Nov 16, 2000 to Dr. Roger Masters, Research Professor of Government, Dartmouth College, Department of Government, NH.

> "To answer your first question on whether we have in our possession empirical scientific data on the effects of fluosilicic acid or sodium silicofluoride on health and behaviour, our answer is no."
>
> "We have contacted our colleagues at NHEERL and they report that with the exception of some acute toxicity data, they were unable to find any information on the effects of silicofluorides on health and behaviour."
>
> "In collecting the data for the fact sheet, EPA was not able to identify chronic studies for these chemicals." *Source: US EPA Letter to Honorable Ken Calvert, June 23, 1999.*

Conclusions

Laws and regulations in 9 provinces in Canada require that water operators inject into their public drinking water only such products that are derived from a manufacturer that has fulfilled all requirements of ANSI/NSF Standard 60 for that product.

NSF's General Requirement 3.2.1 requires that the manufacturer **submit Product Review Data for its specific product**. Manufacturer's Safety Data Sheets (MSDS) and Certificates of Analysis are not a viable substitute for the manufacturer's own declaration in the form of Product Review Data, as they do not cover the essential details. Water operators and municipal councillors must obtain complete copies of the Product Review data to ensure that the product they are purchasing is compliant with the NSF standard and legal requirement. This product review data is essential for accountability, transparency/full disclosure, conformance with industry standards, and compliance with existing laws. A failure to produce the product review as outlined in section 3.2.1. demonstrates a failure to comply with the standard.

A failure of NSF manufacturers to make available the two new toxicology studies demonstrating harm from long-term use, is in violation of NSF Standard 60, General Requirements, outlined in section 3.2.1.

It would appear that NSF certification is not proof of NSF Standard 60 compliance. Due to this

unfortunate circumstance, all those responsible for the safety of these products, including municipal council members and water operators, must exercise due diligence in determining the actual facts.

Reliance on endorsements, even from those with authority, cannot be viewed as a substitute for the evidence. Without full disclosure, statements of safety and effectiveness are merely endorsements.

C. Accountability, Transparency/Full Disclosure, Compliance with Existing Law(s), Conformance with Industry Standards, Fulfilling Legislative Intent

WHO IS RESPONSIBLE???

1. Municipalities decide to implement artificial water fluoridation;
2. Municipalities choose the fluoridation product (except in Quebec);
3. Municipalities buy the fluoridation product (except in Quebec);
4. Municipalities put the fluoridation product into drinking water.

Justice Dennis O'Connor, 2002, Report of the Walkerton, Ontario, Canada Inquiry

> "Given that the safety of drinking water is essential for public health, those who discharge the oversight responsibilities of the municipality should be held to a statutory standard of care."

ONTARIO: Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils
http://guelph.ca/uploads/ET_Group/waterworks/Water%20Quality/Appendix%20A%20-%20Taking%20Care%20of%20Your%20Drinking%20Water_A%20Guide%20for%20Members%20of%20Municipal%20Councils.pdf

- "The Safe Drinking Water Act, 2002 includes a statutory standard of care for individuals who have oversight responsibilities for municipal drinking water systems that can extend to municipal councillors as of January 1, 2013. There are legal consequences for negligence, including possible fines or imprisonment." p3
- "Section 11 of the SDWA describes the legal responsibilities of owners and operating authorities of regulated drinking water systems." p6
- "Owners and operators are responsible for ensuring their drinking water systems: provide water that meets all prescribed drinking water quality standards operate in accordance with the Act and its regulations," p6
- "It is important that members of municipal council and municipal officials with decision-making authority over the drinking water system understand that they are personally liable, even if the drinking water system is operated by a corporate entity other than the municipality."

D. NO FEDERAL REGULATION OF FLUOROSILICATES USED IN DRINKING WATER

Environmental laws designed to protect public safety regulate the fluoride gases hydrogen fluoride and tetrafluoride when they are emitted into the air by polluting industries such as the phosphate mining

industry, aluminum industries, etc., by requiring the use of smoke stack scrubbers to capture and remove these gases. See relevant quotes:
http://www.newmediaexplorer.org/chris/Clinch_2009_Fluoride_Air_Pollution1.pdf

The fluoride products used in artificial water fluoridation (fluorosilicates) are defined as “toxic substances” recommended for “virtual elimination” by various environmental laws and treaties designed to protect public safety. See relevant quotes:
http://www.newmediaexplorer.org/chris/Clinch_2009_Time_Line.pdf

Fluorosilicates are also defined as “hazardous waste” according to a wide range of international, federal and provincial laws designed to protect public safety. See discussion and relevant quotes:
http://www.newmediaexplorer.org/chris/Clinch_2011_Fluorosilicates_are_Hazardous_Waste.pdf

- the Hazardous Products Act 2010 [R.S., 1985, c. H-3];1
- the Canadian Environmental Protection Act 1999, c. 33 [CEPA Section 7, Division 8: Control of Movement of Hazardous Waste];2
- the Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (EIHWHRMR);3
- the Interprovincial Movement of Hazardous Waste Regulations (IMHWR);4
- the Transportation of Dangerous Goods Regulations;5
- the US Code of Federal Regulations, Title 49 (49CFR), US Toxicity Characteristic Leaching Procedure, SW846, Test Method 1311;6

Currently, fluorosilicates are classified and strictly regulated as a “hazardous waste” when handled in bulk. When this identical material is added to drinking water, it is unregulated, and untested for human consumption. 7

The requirements of these environmental laws are in conflict with the policy of artificial water fluoridation promoted by Health Canada and the Public Health Agency of Canada. A recent decision in Australia provides legal precedent for understanding how to deal with these conflicts.

Oshlack v. Rous Water, 2011 http://www.ukcaf.org/files/biscoe_decision_may_2011.pdf

Oshlack v Rous Water had its first hearing in the Land and Environment Court, which is equal to the Supreme Court in New South Wales, on March 14, 2011, with a decision handed down by the Honourable Justice P. M. Biscoe on April 28, 2011. Judge Biscoe notes that where environmental laws conflict with public health policy, legislation permitting the policy of artificial water fluoridation (e.g., Fluoridation Act) cannot be considered in isolation (i.e., these laws are not “unfettered”), as previously understood. The full impact of artificial water fluoridation on human health and the environment must also be considered.

- The respondents are 'required to comply with the provisions of ss 111 and 112 of the EPA Act with respect to the impacts on human health and the environment of adding fluorine to the water supply when determining to approve the construction of the Marom Creek Fluoridation plant.'

Implications:

Currently, environmental laws, regulations and treaties
http://www.newmediaexplorer.org/chris/Clinch_2009_Time_Line.pdf
http://www.newmediaexplorer.org/chris/Clinch_2011_Fluorosilicates_are_Hazardous_Waste.pdf
are in conflict with the Fluoridation Act of Ontario and the Safe Drinking Water Act of Ontario, which provide the regulations permitting the policy of artificial water fluoridation.

This legal precedent makes it clear that any legislation which permits the policy of artificial water fluoridation must also consider all environmental legislation designed to protect the environment and human health.

Judge Biscoe makes the distinction between a direction to fluoridate and the discretionary right to fluoridate under an approval. In the context of approvals, you are not required to carry out the activity of artificial water fluoridation, but you are empowered to do so. A direction requires the activity to be carried out.

According to Judge Biscoe, "The combined effect of both statutes [EPA Act and Fluoridation Act] is to permit the authority to add fluorine and to comply with the requirements of ss 111 and 112 [EPA Act] before doing so." (section 56, page 25) In other words, artificial water fluoridation is permitted only if it satisfies the requirements of the environmental legislation.

Citations

1Available from: http://laws.justice.gc.ca/en/H-3/
2Available from: http://laws.justice.gc.ca/eng/C-15.31/page-6.html#anchorbo-ga:l_7-gb:l_8
3Available from: http://www.ec.gc.ca/ceparegistry/documents/regs/g2-13911_r1.pdf
4Available from: http://www.canlii.org/en/ca/laws/regu/sor-2002-301/latest/sor-2002-301.html
5 Available from: http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=24374285-1&offset=8&toc=show#h
6 Available from: http://www.ehso.com/cssepa/TCLPfaqs.htm
7. The government does not regulate the fluorosilicate products which are used as medication, even though all other fluoride products used for dental care are regulated under the *Food and Drugs Act* and its associated *Regulations*. (see below)

There are no federal safety standards for drinking water "additives". Self-regulation by the private consortium called National Sanitation Foundation (NSF) is used instead.

The government also does not regulate the fluorosilicate products which are used as medication. Hydrofluorosilicic acid is an unregulated, unapproved medication, as stated clearly by the Supreme Court of Canada, Health Canada and the legislation called the Food and Drugs Act, as follows:

> The SUPREME COURT OF CANADA (Metropolitan Toronto v. Forest Hill (Village), [1957] S.C.R. 569) states that fluoridation is "compulsory preventive medication" used for a "special health purpose."
>
> HEALTH CANADA states the following in Petition #299 (Answer #3) to the Auditor General of Canada: "Health Canada does not regulate hexafluorosilicic acid or sodium silicofluoride

products, the actual products used in water fluoridation, which are allegedly used as a medical treatment to prevent dental disease."

FOOD AND DRUGS ACT definition of "DRUG" is as follows: "includes any substance or mixture of substances manufactured, sold or represented for use in: the diagnosis, treatment, mitigation or prevention of a disease, disorder or abnormal physical state, or its symptoms, in human beings and animals"

Artificial water fluoridation disproportionately harms infants, blacks, hispanics, the elderly, those who drink large volumes of water, and those with hypersensitivities or medical conditions, more often than healthy, white adults, as described in the NRC 2006 Review on Fluorides and other authoritative sources:
http://www.newmediaexplorer.org/chris/Clinch_2009_Social_Justice_equals_Protecting_Vulnerable.pdf

Because fluoride can disproportionately harm poor citizens and black families, Andrew Young, former U.N. Ambassador and former Atlanta Mayor, along with Reverend Dr. Gerald Durley, both inductees in the International Civil Rights Walk of Fame, as well as Martin Luther King's daughter Bernice have expressed the following concerns about the fairness, safety, and full disclosure regarding artificial water fluoridation:

Dr. Durley wrote, "The National Research Council (NRC) of the National Academy of Sciences has designated kidney patients, diabetics, seniors, and babies as 'susceptible subpopulations' that are especially vulnerable to harm from ingested fluorides. Black citizens are disproportionately affected by kidney disease and diabetes, and are therefore more impacted by fluorides."

Ambassador Young wrote, "I am most deeply concerned for poor families who have babies: if they cannot afford unfluoridated water for their babies' milk formula, do their babies not count? Of course they do. This is an issue of fairness, civil rights, and compassion. We must find better ways to prevent cavities, such as helping those most at risk for cavities obtain access to the services of a dentist."

League of United Latin American Citizens Condemns Fluoridation as a Civil Rights Violation. LULAC resolution, full text is available here:
http://lulac.org/advocacy/resolutions/2011/resolution_Civil_Rights_Violation_Regarding_Forced_Medication/

Canada v PHS 2011, SCC 44 ruling: http://scc.lexum.org/en/2011/2011scc44/2011scc44.html The SCC judges made their unanimous decision based on 2 fundamental concepts:

1. Arbitrariness (sec 129-132)– decision is unrelated to the clear objective of public safety; undermines the very purpose of the legislation (public safety) **without explanation of exemption;** IS THE CURRENT EXEMPTION OF REGULATION FOR FLUOROSILICATES JUSTIFED? is there any legislation or government decision process which provides supporting reasoning to justify the current exemption of fluoridation products (silicofluorides) from regulation or should the Health Canada decision to not regulate these fluorosilicate products be

considered to be arbitrary?

2. Disproportionality (sec 133) – decision cites Section 7 of the Canadian Charter (Legal Rights and the principle of Fundamental Justice: Life, Liberty, Security of Person). SHOULD FLUOROSILICATES BE REGULATED IN THE INTEREST OF PUBLIC SAFETY? a) fluorosilicates are used as a medication, b) Health Canada and the Public Health Service make health claims permissible only with drugs under the Food and Drugs Act; c) fluorosilicates satisfy the legal definition of drugs. DO THE CURRENT EXEMPTIONS for fluorosilicates violate the principle of FUNDAMENTAL JUSTICE (sec 7 of the Canadian Charter) or the legislative intent to protect public safety.

Conclusions

1.Toxicology studies are well-established and fundamental scientific protocols for determining the safety of products.

2. Toxicology studies are also a legal requirement in 9 out of 13 provinces and territories in Canada including Ontario, Northwest Territories, Alberta, Saskatchewan, Manitoba, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador, which use NSF Standard 60 as a "prescribed standard".

3. Not even one toxicological study on the health or behavioral effects of continued use of hydrofluosilicic acid or sodium silicofluoride, with or without contaminants; and certainly not in combination with chloramines, where the two are paired to separate lead from brass, are available, to demonstrate safety. Two studies are now available (Sawan et al. 2010, Liete et al 2011) showing health harm from long-term use of fluorosilicates.

4. Fluorosilicates do not satisfy the safety requirements or the legal requirements ("prescribed standards") for drinking water in 9 out of 13 provinces.

5. The promotion of illegal products is also illegal. The promotion of products which are not safe is irresponsible and morally reprehensible.

6. No randomized, controlled human trials (RCTs) have been done using these products used in artificial water fluoridation for specific health purposes.

Questions:

1. **Has Health Canada provided adequate reasoning to support their current exemption of fluorosilicates used in drinking water as medication?**
2. **Does Health Canada's current exemption of fluorosilicates from all regulation fulfil the legislative intent to protect public health?**
3. **Is Health Canada promoting a fluoride product which is NOT SAFE and NOT LEGAL?**
4. **Is Health Canada making illegal health claims for these fluoride products? The Canadian Food Inspection Agency recently ruled that the health claims for bottled fluoride water (Nursery Water) are NOT LEGAL. Are the health claims for municipal water LEGAL?**

NOTE: photocopies of all letters and documents are available upon request.

E. DISSEMNINATION OF FALSE AND MISLEADING INFORMATION

The dissemination of false and misleading information can be explained in 2 possible ways:

1. The individuals or organizations do not have sufficient expertise on this issue, as implied by their position of authority; or
2. The individuals or organizations are intentionally misleading the public.

E.1. Health Canada Misrepresents National Research Council Review 2006

Health Canada committee members involved in this review knew, or should have known, what the actual findings of the NRC committee were. Misrepresentation of this review is problematic because:

- it casts doubt on the competence of those involved in this review;
- damages the credibility of our national regulatory body;
- this mis-information is repeated by government agencies, individuals and organizations.

The Health Canada 2009 draft review incorrectly claims the following: “The [NRC] Committee restricted its attention to studies that examined long-term exposure to fluoride in the range of 2–4 mg/L or above in drinking water.”

Two of the NRC 2006 committee members reply:

Dr. John Doull (Chair of the National Academy of Science 2006 committee). Email: 20/3/2010 to Carole Clinch

> “Our charge was to evaluate the EPA permissible levels for fluoride in drinking water which are 2 ppm and 4 ppm and we focused on those levels but our report contains considerable information on lower levels of fluoride.”

Dr. Kathleen Thiessen (Member of the National Academy of Science 2006 committee)
http://www.newmediaexplorer.org/chris/Dr_Thiessen_2009_Health_Canada_Misrepresents_NRC_Review.pdf

> “Health Canada gives an inaccurate characterization of the National Research Council's work.”
>
> “The NRC (2006a) did not restrict its attention to studies of fluoride in the range of 2-4 mg/L or above in drinking water. Many of the cancer studies and Down syndrome studies involved "fluoridated" water (0.7-1.2 mg/L). Many of the endocrine studies involved exposure ranges comparable to those expected for populations on fluoridated water. The discussions of exposure and of pharmacokinetics involved the whole exposure range, including fluoridated water.”

http://www.newmediaexplorer.org/chris/P4SDW_2009_Jun25_Health_Canada_Chief_Dental_Officer_Appendix%20A2.pdf

Dr. Peter Cooney: Misrepresentation of Material Fact
http://www.newmediaexplorer.org/chris/Clinch_2010_Response_Cooney-Sauve_2006_Advocacy_Process_to_win_fluoridation_referendums.pdf

E.2. Misrepresentation of Fluorosilicates used in Drinking Water

The Executive Summary of a preliminary investigation of Canadian Law as it relates to fluorosilicates used in drinking water, as submitted to the Justice Minister and the Auditor General of Canada is available here:
http://www.newmediaexplorer.org/chris/Canada_Request_for_Audit_2011_Executive_Summary.pdf

I filed a formal complaint to the Canadian Food Inspection Agency (CFIA) on November 25, 2010 regarding the manufacturer of the product called "Nursery Water". I noted in March of 2011 that all health claims had been removed from the Canadian and US websites.

www.nurserywater.com
www.nurserywater.ca

The CFIA confirmed in a letter and by phone that the health claims made by the manufacturer of the product called Nursery Water is not compliant with the legal requirements of the Food and Drugs Act.

> "We have realized that the Nursery Water contains non-permitted claims and CFIA is looking into your enquiry." Source: Email dated Nov 26, 2010,Eva Kaczmarcyzk, Food Specialist | Spécialiste des aliments, Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments, 709 Main Street West, Hamilton ON L8S 1A2, Tel. /Tel.: (905) 570-7243 | General Telephone: 1-800-667-2657, Email: eva.kaczmarczyk@inspection.gc.ca
>
> Carissa Sirikitputtisak stated that the health claims for the product called Nursery Water were not permissible. Source: phone call Oct 4, 2011 at 10:20am from Carissa Sirikitputtisak, Food Specialist/Inspector from the CFIA in Barrie, Ontario.

An ATIP request for information relating to the CFIA investigation has been submitted, (Mailed Oct 17, 2011 by registered mail, received and signed on Oct 20, 2011).

IMPLICATIONS:

The Canadian Food Inspection Agency has ruled that the **health claims** for water with sodium fluoride added (F concentration of 0.7 ppm) which are sold in bottles are **NOT LEGAL.**

Health Canada and the Public Health Service make health claims for municipal drinking water with fluoride added.

Are these health claims **LEGAL?**

Nemphos v. Nestle, Maryland, filed Aug 2011
Nidel Law, P.L.L.C. is currently investigating injuries as a result of drinking bottled water with added fluoride. **http://www.nidellaw.com/blog/?m=201109**

Bait and Switch?

Foli v. MWD of SoCal, California, filed Aug 2011
"It does challenge MWD's **bait and switch tactics** of orchestrating statements by them and their down-line distributors of water to individual consumers when MWD knew that the actual drug product that they deliver had never had a toxicological study performed on the health and behavioral effects of its continued use until 2010, much less approval for MWD's perpetuation of absolute health claims." Kyle Nordrehaug, attorney for the plaintiffs, available from: [emphasis added]
http://fluoride-class-action.com/wp-content/uploads/Foli-v-metropolitan-water-district-of-southern-california-11CV1765-JLS-5373546-0-9893.pdf

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Toxicity of "Natural" Calcium Fluoride vs "Man-Made" Sodium Silicofluorides

Health Canada knows, or should know, that the man-made fluoride products called fluorosilicates which are most commonly used in artificial water fluoridation are not "natural" and have not been proven to be chemically, or physiologically equivalent to "natural" fluorides such as calcium fluoride (CaF2).

Promoters of artificial water fluoridation (see Health Canada and public health websites) discuss "natural fluoride" when discussing this policy. Naturally-occurring fluorides (e.g., calcium fluoride) do not have the same acute toxicity as the made-made fluorides used in artificial water fluoridation (e.g., Sodium Fluoride (NaF), Hexafluorosilsicic acid (H2SiF6) and Sodium Silicofluoride (Na2SiF6) are the two fluoride products most commonly used in artificial water fluoridation).
According to the Merck Index, 7th edition, sodium fluoride is considerably more toxic than calcium fluoride.

	Acute Toxicity = Lethal Dose at which 50% of test subjects die Source: Merck Index 7th Edition
Calcium Fluoride	LD_{50} = 3,750 mg/kg
Sodium Fluoride	LD_{50} = 125 mg/kg

1. Natural calcium fluoride is found in nature and is not considered a toxic compound because of its comparatively high lethal oral acute dose in rodents where 50% of the animals die, as demonstrated in the Merck Index, 7th Edition (LD50 = 3,750mg/kg). Sodium fluoride has a comparatively low acute lethal oral doses in experimental animals, which is comparable to arsenic and lead[1] (LD50=125mg/kg). Fluoridation products such as sodium fluoride are considered lethal from between 1 to 5mg/Kg body

weight.[2],[3] which is in contrast to calcium fluoride found naturally in water, considered lethal at about 5,000mg/Kg BW.[4]

2. Natural calcium fluoride does not have the same corrosive ability with metals in neutral or acidic waters, as do the man-made fluorides used in artificial water fluoridation.

3. Natural calcium fluoride also does not require neutralization with pH adjustment chemicals such as sodium hydroxide prior to injection into water, which now is a common practice for water districts. These pH adjustment chemicals add considerably to the costs of artificial water fluoridation, sometimes exceeding the costs for the fluoride products.[5]

In conclusion
Fluoride ion from the fluoride products used in artificial water fluoridation are not biologically or even physico-chemically the same as the fluoride ion from natural calcium fluoride, for otherwise identical concentrations of ionized fluoride ion. Health Canada has based its regulatory guidelines (MAC levels) on the safer calcium fluoride existing in source water,[6],[7]without taking into consideration the calcium and magnesium levels (water hardness) or the duration of exposure. No government agency has demonstrated the bioequivalence of these various fluoride compounds. Therefore, no government policy decision which assumes their bioequivalence can be considered to be scientifically valid.

Citations

1 The Merck Index, 9th edition, Merck and Co., Inc., Rahway, New Jersey, 1976.

2 Table A: http://www.newmediaexplorer.org/chris/Table_A-Days_to_Reach_Acute_F_Intake_at_5mgperkgShortest.pdf

3 Akiniwa K. Re-examination of acute toxicity of fluoride. Fluoride 1997;30(2):89-104.

http://www.fluoride-journal.com/97-30-2/302-89.htm

4 Merck Index, 9th Edition, Merck and Co., Inc., Rahway, N.J. 1976, p 1663.

5 http://www.newmediaexplorer.org/chris/Clinch_2010_Costs_Artificial_Water_Fluoridation.pdf

6 Simonin P, Pierron A. 1937 Toxicite brute des derives fluores CR séances Soc Biol Fil 124: 133-134. From page 88 of Waldbott 1978. – “Calcium fluoride [CaF2] is 20 times less toxic than H2SiF6 or Na2SiF6” - “A comparison of lethal doses of fluorides in guinea pigs: Hydrofluorosilicic acid 200 mg/kg, Sodium fluorosilicate 250 mg/kg, Sodium fluoride 250 mg/kg. Calcium fluoride 5,000 mg/kg”

7 SCHER (Scientific Committee on Health and Environmental Risk). 2010. Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. European Commission. Directorate-General for Health & Consumers. May 18. “In fish and invertebrates, fluoride toxicity decreases with increasing calcium and chloride concentrations in the water. Decrease with calcium is mainly due to the formation/ precipitation of innocuous complexes such as Ca5(PO4)3F, CaF2 and MgF2.” Available from: http://www.ukcaf.org/schers_verdict_on_water_fluoridation.html

Oshlack v. Rous Water, 2011. Available from: http://www.ukcaf.org/files/biscoe_decision_may_2011.pdf

This is a recent Australian Judicial Review in the Land and Environment court, which is equal to the Supreme Court in New South Wales 2011. Judge Biscoe ruled that “impacts on human health and the environment of adding fluorine to the water supply” must be considered when determining safety. Using the Code of Practice common to all states, Judge Biscoe cites the Australian Environmental Planning & Assessment Act, Part 5 Sect 111 & 112.

Fluorosilicates are classified as “Hazardous Waste.

http://www.newmediaexplorer.org/chris/Clinch_2011_Fluorosilicates_are_Hazardous_Waste.pdf

Conclusion: There is no legislation in Canada which specifically permits the addition of hazardous waste (e.g., hexafluorosilicic acid) to drinking water.

Fluorosilicates are Toxic Substances recommended for “virtual elimination”.
If you go to the Canadian Environmental Protection Act, Schedule 1, available from:
http://laws.justice.gc.ca/eng/C-15.31/page-9.html#anchorsc:1
you will find a list of what our Canadian Government deems to be “toxic substances” which are defined as persistent, bioaccumulative, toxic, and anthropogenic (man-made - hexafluorosilicic acid is man-made by-product from the smoke stack scrubbers of phosphate mining industries and other manufacturing facilities).
http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=0DA2924D-1
Inorganic fluoride is number 40. If you then consult the following quotes from various Canadian legislation:
http://www.newmediaexplorer.org/chris/Clinch_2009_Time_Line.pdf
you will see that a selected number of substances have been targeted for “virtual elimination” because of their extreme toxicity.

Conclusion: There is no legislation in Canada which permits the addition of “toxic substances” recommended for “virtual elimination” into drinking water.

D. Who Accepts Responsibility for the Safety of Fluoride Products?

The organizations who promote the use of fluoride products used in artificial water fluoridation claim no responsibility for their safety. They state that municipalities are responsible for:

1. the costs of artificial water fluoridation;
2. adverse health effects.

http://www.newmediaexplorer.org/chris/Clinch_2009_Who_Claims_Responsibility_for_Safety.pdf

The organizations and individuals who promote artificial water fluoridation claim that municipal governments are clearly responsible for public safety regarding fluoride products used in artificial water fluoridation because:

1. they decide to add fluoride products;
2. they choose the fluoride products (toxic substances and hazardous wastes);
3. they buy the fluoride products;
4. they add the fluoride products to the drinking water.

I refer you to the following article on calls for “fluoridegate” investigations in the USA:

http://www.justice.org/cps/rde/xchg/justice/hs.xsl/14815_14817.htm

From: ruth.bednar@sympatico.ca [mailto:ruth.bednar@sympatico.ca]
Sent: Wednesday, June 29, 2011 11:13 AM
To: MAYOR EMAIL; Don Jenkins; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: FW: Water_fluoridation_and_health[2].pdf - Adobe Reader (Reference from Dr. Charles Gardner)

Dear Mayor Orsi and Councillors:

I have forwarded **a reference from Dr. Charles Gardner** (from his references Appendix "A" Page 4 'March 31, 2011' letter to The District Municipality of Muskoka). From his reference you will be able to assess the pros and cons of artificial water fluoridation.

Note the Conclusion from this reference:

"One of the key Issues pertaining to water fluoridation is that of exposure. Because of the use of topical health care products (eg. toothpaste) containing fluoride and the potential for exposure from a number of other sources, it is especially important to understand better the total exposure that individuals are experiencing. It is also necessary to **gain a better understanding of the bioavailbility and absorption of fluoride from naturally fluoridated vs. artificially fluoridated water."**

"The main health outcomes of interest and relevnce are dental fluorosis, bone health, and cancer."

"There is almost universal agreement that tooth decay in children is related to social class."

"**If the bioavailability of fluoride from artificially fluoridated water is found to be substantially greater than from naturally fluoridated water**, then the new studies should address the aggregate rate of accumulation of fluoride in TARGET TISSUES from artificial fluoridation and assess whether this is fast enough to produce a risk of pathological change..."

"Fluoride ingestion (from all sources) and fluoride excretion - and therefore fluoride retention - should be measured in children"

"The relative importance of water as a source of fluoride ingestion in children should be determined"

Please take time and review Dr. Charles Gardner's reference as well as the other references that were forwarded.

Sincerely,

Ruth Bednar
RNCP
ROHP

Working group report

Water fluoridation and health

MRC
Medical Research Council

Lay summary

The practice of adding fluoride to drinking water to improve dental health has been endorsed by numerous national and international health institutions, including the World Health Organization. It has been argued that in communities with piped water supplies it is the most cost effective method of reaching the whole population, particularly children with a high risk of tooth decay.

Much of the evidence that links water fluoridation to improved dental health comes from research conducted several decades ago. The Department of Health therefore commissioned the NHS Centre for Reviews and Dissemination at the University of York to produce an up to date review of the topic, looking at all relevant studies.

The York review, published in September 2000, confirmed the beneficial effect of water fluoridation on dental caries (cavities), but also highlighted the increased prevalence of dental fluorosis (a defect of the enamel ranging from mild speckling to more gross effects) associated with fluoridation. The review concluded that little high quality research had been carried out on the broader question of fluoride and health, and that the available evidence did not allow confident estimates to be made of other possible risks to health or of the benefits of water fluoridation in reducing dental health inequalities.

In light of these findings the Medical Research Council, at the request of the Department of Health, set up the present Working Group to consider what further research is required to improve knowledge about fluoridation and health. This report aims to identify areas of uncertainty regarding the balance of benefits and risks of water fluoridation, and to make appropriate recommendations for research to address these uncertainties.

With regard to public knowledge and understanding of the fluoridation issue, this report identifies additional information needed by the public to make informed decisions. For example, better information is needed on the prevalence of different forms of dental fluorosis (and their visual/aesthetic impact) and on similar looking tooth defects that are not associated with fluoridation.

Because of the wide use of toothpastes and other dental health care products containing fluoride, and the potential for fluoride exposure from a number of other sources, it is especially important to understand better the total exposure that individuals are experiencing. This knowledge should then be used in any future studies on the impact of water fluoridation. It is also important to gain a better understanding of any differences there might be in the uptake of fluoride from artificially fluoridated as opposed to naturally fluoridated water, and to determine the impact, if any, of the level of water hardness. Trends in fluoride exposure, especially in children, need to be tracked.

Research recommendations on caries include the need to study the impact of water fluoridation on caries reduction in children against a background of widespread use of fluoride toothpaste, and to extend knowledge on how the effects of water fluoridation vary with social class. There is also a need to understand better the economic impacts and the effects of fluoridation on health and well-being beyond the usual measures of decayed, missing or filled teeth. Further work is warranted on the effects of fluoridation on dental health in adults.

Medical Research Council working
group report:
Water fluoridation and health

September 2002

The public's level of awareness and understanding of dental fluorosis is generally low. Future research should aim to improve this situation as well as improving knowledge on the incidence and severity of fluorosis. Research is specifically recommended that determines the prevalence of dental fluorosis in fluoridated and non-fluoridated communities and establishes the public's perception of fluorosis.

There is almost universal agreement that tooth decay in children is related to social class. The majority of the research conducted to date indicates that water fluoridation reduces dental caries inequalities between high and low social groups. No studies have shown fluoridation to increase inequalities. Further studies are recommended that look at appropriate measures of social inequalities related to water fluoridation, dental caries and fluorosis, taking into account important factors such as use of fluoridated toothpaste and dietary sugar ingestion.

There are a number of possible health outcomes (other than dental health) related to water fluoridation. The possibility of an effect on the risk of hip fracture is the most important in public health terms. The available evidence on this suggests no effect, but cannot rule out the possibility of a small percentage change (either an increase or a decrease) in hip fractures. Current estimates of the size of any effect are based on a combination of studies of naturally and artificially fluoridated water. If studies show that the uptake of fluoride from artificially fluoridated water is substantially higher than from naturally fluoridated water (see above), then it will be necessary to investigate further the relationship of hip fractures specifically to long term consumption of artificially fluoridated water. Research results currently available do not allow a useful estimate to be made of the impact of fluoridation on other bone disorders. However, the few studies that have been carried out do not suggest a problem and studies on such diseases are considered of lower priority.

Another issue is the possible role of fluoride and fluoridation on cancer incidence. Although available evidence suggests no link between water fluoridation and either cancer in general or any specific cancer type (including osteosarcoma, primary bone cancer), an updated analysis of UK data on fluoridation and cancer rates is recommended. Also, if new studies are undertaken on the incidence and causes of osteosarcoma then fluoride exposure should be assessed together with the other possible risk factors.

Additional health outcomes suggested by some to be associated with fluoride ingestion include effects on the immune system, reproductive and developmental (birth) defects, and effects on the kidney and gastrointestinal tract. Other concerns are related to the chemicals that are added during the fluoridation process, and to indirect effects such as increased leaching of lead from pipes and aluminium from cooking utensils and altered uptake or toxicity of these substances. There is no evidence for any significant health effects of this type and no specific research is recommended, although it is appropriate to keep the area under review.

1. Introduction

1.1 Background to the review

In September 2000, the NHS Centre for Reviews and Dissemination at the University of York published a systematic review of epidemiological studies on water fluoridation and health (NHS CRD, 2000). The review had been commissioned by the Chief Medical Officer of the Department of Health (DH) in recognition of the fact that much of the research evidence linking water fluoridation to improved dental health had been undertaken several decades earlier (see 'Our Healthier Nation', paragraph 9.20).

The York Review confirmed the beneficial effect of water fluoridation on dental caries, but also suggested that this should be considered alongside the increased prevalence of dental fluorosis. Another key conclusion of the review was that little high quality research had been undertaken in the area of fluoride and health more broadly. The available research evidence was considered insufficient to allow a confident estimate of the risks that might be associated with non-dental health outcomes or of the potential benefit of water fluoridation on health inequalities associated with dental caries.

In light of these findings, DH approached the Medical Research Council (MRC) to take forward the conclusions and recommendations of the York Review and consider what further research might be required to improve the evidence base in the area of fluoride and health. The MRC established a Working Group to identify where the existing knowledge base and public health policy might benefit from further research, and how this evidence might best be obtained.

The terms of reference of the Working Group were to:

- Provide advice on current scientific evidence regarding the health effects of fluorides in the context of water fluoridation;
- Consider what further research in this area might be required and what priorities should apply to usefully inform public health policy in this area;
- Report to the MRC Physiological Medicine and Infections Board and the MRC Health Services and Public Health Research Board; and
- Report to the Department of Health.

The Working Group[1] met five times between February and November 2001. The conclusions and research recommendations of the Working Group are encapsulated in this report (which is to be considered by the relevant MRC Research Board(s) prior to submission to the Department of Health.)

1.2 Structure of the report

The report contains five main sections in addition to this scene-setting introduction. Section 2 takes a broad look at risk assessment issues, including the public perception of risk. Section 3 covers the important issue of total exposure; fluoridated drinking water is just one of many potential sources of fluoride to which people are exposed. The principal health outcomes associated with fluoride exposure are addressed in section 4, which includes consideration of the effects of social class. Section 5 discusses other potential health outcomes, including those for which there is little available evidence, and also considers some indirect effects of adding fluoride to drinking water. All these sections of the report

1 Membership: Professor Anthony McMichael (Chair; London School of Hygiene & Tropical Medicine – left the Working Group July 2001); Dr. Paul Harrison (Deputy Chair; MRC Institute for Environment and Health, Leicester); Professor David Coggon (MRC Environmental Epidemiology Unit, Southampton); Ms Ailsa Harrison (MRC Consumer Liaison Group); Dr. Timothy Key (University of Oxford); Professor Michael Lennon (University of Liverpool); Dr. Peter Mansfield (Lincolnshire – left the Working Group September 2001); Professor Stephen Palmer (University of Wales College of Medicine); Dr. Mark Petticrew (MRC Social and Public Health Sciences Unit, Glasgow); Professor Nigel Pitts (University of Dundee); Professor Andrew Rugg-Gunn (University of Newcastle); Professor Elizabeth Treasure (University of Wales College of Medicine); Dr. Alan Glanz (Department of Health); Dr. Michael Waring (Department of Health); Mr Jerry Read (Department of Health); and Dr. Anthony Peatfield (MRC Head Office, replaced by Dr Declan Mulkeen in September 2001), Dr. Angela Cooper (MRC Head Office, replaced by Dr Matthew Wakelin in July 2001).

contain research recommendations; the purpose of section 6 is to present the key conclusions of the report and to list those recommendations that are considered most important.

1.3 Fluoride and fluoridation

Fluoride occurs naturally in soil, water, plants and animals in trace quantities. In groundwater, natural fluoride concentrations range from trace quantities to over 25mg/l.

When fluoride is ingested by humans and other animals, some is taken up by body tissues, with long-term deposition in teeth and bones. The fluoride content of tooth tissues reflects the biologically available fluoride at the time of tooth formation – after which time, except for the outermost layer of the enamel, fluoride levels remain constant (WHO, 1994).

Early epidemiological studies, comparing local populations using both observational and quasi-experimental designs, had indicated a significant reduction in dental caries in childhood within populations exposed to higher levels of fluoride in drinking water. Accordingly, in 1952, on the recommendation of the MRC, the British Government initiated a study into water fluoridation with a view to advising whether fluoride should be added to drinking water supplies in the UK (HMSO, 1962; HMSO, 1969). As a result, a number of Local Authority water fluoridation schemes were introduced in England and Wales between 1964 and 1975. Some five million people now receive water in which the fluoride content has been artificially increased to a level of one part per million[2]. Major schemes are in operation in Birmingham and throughout the West Midlands, and also in Tyneside. In addition, about 500,000 people in this country receive water which naturally contains fluoride at or about the level of one part per million. A further one million people receive water which naturally contains fluoride at a lower level, but which is still considered to confer some dental benefits (House of Commons Official Report, 1998).

The Water (Fluoridation) Act 1985 required District Health Authorities to consult widely in determining their policy on water fluoridation, but water fluoridation continues to be an emotive issue. Opponents tend to view it as an infringement of personal rights, and/or believe that it causes ill health. In contrast, proponents consider it a safe, simple, and cost-effective public health measure to reduce the incidence of dental caries (Hamilton, 1992). The practice of fluoridating water has been endorsed by (inter alia) the World Health Organization, the British Medical Association, the Faculty of Public Health Medicine, the British Dental Association and, in the USA, by the Surgeon General, the American Medical Association and the American Dental Association.

It has been argued that, if the community has a piped water supply, water fluoridation is the most cost-effective method of reaching the whole population, including children at highest risk (Akenhurst & Sanderson, 1994). However, there are potential health disbenefits of fluoride that have to be considered (see Table 1), and also various additional potential sources of exposure. This report aims to identify any areas of uncertainty about the balance between the benefits and disbenefits of water fluoridation, and to make appropriate recommendations for research to remove or reduce these uncertainties.

2 According to Hamilton (1992) the concentration of fluoride in water required for prevention of dental caries is generally agreed to be in the range 0.7-1.2mg/l, although the 1994 WHO report stated that "the world optimum concentration would normally be in the range 0.5 – 1.0 mg/l". In the UK, concentrations of 0.3-0.7mg/l are considered to afford below optimal protection against tooth decay, and at less than 0.3mg/l it is said to be doubtful whether any benefit is gained (Murray et al., 1991).

Table 1: Exposure to fluoride and associated adverse effects

Exposure to fluoride (mg/l drinking water)	Age	Effect
≥2	Child	Dental fluorosis
≥8	All ages	Skeletal fluorosis
≥50 (12hours)	All ages	Gastroenteritis
Pathological doses for exposures other than drinking water		
5-20 mg/m3 air (occupational)	Adults	Crippling fluorosis
2,500-10,000 mg oral	Adults	Acute lethal dose
≥16 mg/kg oral body weight	Child	Acute lethal dose

Adapted from NHMRC, 1991

1.4 References

Akenhurst RL & Sanderson DJ (1994) Cost-effectiveness in dental health: a review of strategies available for preventing caries. British Journal of Medical Economics, 7, 43-54

Department of Health and Social Security, Scottish Office, Welsh Office & Ministry of Housing and Local Government (1969) The Fluoridation Studies in the United Kingdom and the Results Achieved after Eleven Years (Reports on Public Health and Medical Subjects No.122), London, HMSO

Department of Health (1999) Saving Lives: Our Healthier Nation (Cm 4386). London, The Stationery Office
[Available at http://www.official-documents.co.uk/document/cm43/4386/4386.htm]

Hamilton M (1992) Water fluoridation: A risk assessment perspective. J Environ Health, 54, 27-32

House of Commons Official Report (1998) Parliamentary debates, Wednesday 6 May 1998. Hansard, 311, col 697

Ministry of Health, Scottish Office & Ministry of Housing and Local Government (1962) The Conduct of the Fluoridation Studies and the Results Achieved after Five Years (Reports on Public Health and Medical Subjects No.105), London, HMSO

Murray JJ, Rugg-Gunn AJ & Jenkins GN (1991) Fluorides in Caries Prevention, 3rd Edition, Oxford, Butterworth-Heinemann

NHMRC (1999) Review of Water Fluoridation and Fluoride Intake from Discretionary Fluoride Supplements, NHMRC, Melbourne

NHS CRD (2000) A Systematic Review of Public Water Fluoridation (CRD Report No. 18), York, UK, NHS Centre for Review and Dissemination, University of York. [Available at http://www.york.ac.uk/inst/crd/fluorid.htm]

WHO (1994) Fluorides and Oral Health: Report of a WHO Expert Committee on Oral Health Status and Fluoride Use (Technical Report Series 846), Geneva, World Health Organization

2. Risk assessment, management and perception

Making decisions on whether to add fluoride to drinking water (or cease fluoridation) entails a two stage process of risk assessment and risk management. Implementation of the latter should be informed by an awareness of the public's perception of the risk.

2.1 Risk (and benefit) assessment

Risk assessment involves first identifying the potential adverse outcomes (hazards) from a policy, action or situation, and then estimating the chance and likely extent (risks) of their occurrence in those who might be affected, including any particularly vulnerable subgroups.

Depending on the extent and quality of the scientific evidence underpinning this process, estimates of risk may be subject to significant uncertainty. In such situations the extent of the uncertainty should be estimated – ie the range within which risks might reasonably be expected to lie, given what is known.

In the same way that the risks (adverse consequences) arising from a policy or action are estimated, it is also necessary to assess the likely magnitude of any benefits that might accrue. Again, where there are important uncertainties, these must be recognised and as far as possible quantified.

2.2 Risk management

Once the risks and benefits have been assessed, this information must be set alongside other considerations, such as the financial cost of the policy or action, and a decision then made on whether to implement the change. This is not simply a matter of science - it involves value judgements, and individuals may weigh the risks, benefits and attendant uncertainties differently. If the decision must be taken at a community level (as with water fluoridation), it often falls to democratically elected representatives and may follow wider public consultation and debate.

In the case of water fluoridation, information about the nature and likely extent of the benefits and the possible adverse effects comes mainly from pharmacology, toxicology and epidemiology. Pharmacology and toxicology provide evidence on the types of benefit and hazard that could plausibly occur, how these effects might relate to exposure to fluoridated water over time (eg would they be relatively immediate or delayed), subgroups who might be unusually susceptible and, to some extent, the potential frequency of the outcomes. Epidemiology provides more direct evidence on the occurrence of beneficial and adverse effects in affected populations.

There is a range of known or possible impacts of fluoride supplementation on health, some beneficial, some detrimental (see Sections 4 and 5). Some of these effects accrue early (eg reduction in childhood dental caries) while others may occur later (eg any contributions to skeletal fluorosis and other aspects of bone health).

From a public health perspective, the aim is to optimise the overall improvement in population health, while taking account of any differences in susceptibility within the population. To achieve this requires quantitative estimates of the various dose effect relationships, and the capacity to titrate qualitatively different health outcomes against one another (eg reduction in dental caries versus increase in dental fluorosis). In the absence of an agreed, universally applicable, common metric (of which the disability adjusted life year, or DALY, is the current prime candidate within WHO), such comparisons cannot be performed objectively and precisely. Hence, the inevitability of using, at least in part, expert and political judgement to evaluate the pros and cons of fluoride supplementation.

2.3 Public perception of risk

2.3.1 Achieving informed public debate about complex risk/benefit information

There is a growing appreciation of the need for more public information and education in the area of health risk and for a constructive dialogue between scientists, policy makers and the public on such issues. Both DH and the Department for Environment, Food and Rural Affairs (DEFRA) are currently looking at these issues. The presentation of this type of information to the public needs to be jargon free and should not assume high levels of statistical or other technical awareness. The communication of complex choices where the benefits and risks are of very different types, as is the case with water fluoridation, must be done in a way that increases the probability that those choices will be well informed. On any given topic, there may be tensions arising from opposite viewpoints.

2.3.2 Presenting to the public the inevitability of uncertainty in research findings

In an era when 'science' is under increasing public and political scrutiny, and in which the media can generate unrealistic and unachievable expectations of certainty or 'proof', there is a need to communicate honestly and openly about the levels of certainty that can and cannot be inferred from research findings. Uncertainty is an inherent feature of science and medicine, but this is a concept that seems not to be well understood by the public.

2.3.3 Explaining the concept of different strengths of evidence to the public

It is important to explain simply the concept of differing 'strengths' of evidence that can be derived from different types of research design, as well as the changing methodological standards that have been used in research over time. For example, it is unrealistic in many fields to expect a study carried out in the 1970s necessarily to conform to the methodological standards judged appropriate in the 2000s. Also, the quality of research published on the Web and in other non-peer reviewed sources is unlikely to match that of research published in the standard scientific journals, and therefore generally carries little weight. Some members of the public (and many health professionals) may not yet be used to these concepts.

2.3.4 Public perception of fluoridation

There has been limited dialogue with the general public on the fluoridation issue. A study with focus groups in three non-fluoridated areas of England (Hounslow, Leeds and Oldham) indicated that members of the public wish to be informed of water fluoridation plans but do not see themselves as being appropriate arbiters of decisions about implementation (Lowry et al., 2000). However, even where the public does not wish to make decisions, this does not imply that this opportunity should be withdrawn.

2.3.5 Information needs

Listed below are some specific issues that could usefully be communicated to the public about water fluoridation:

- The actual coverage of water fluoridation in the UK at present (many assume it is more widespread than it is)
- The consequences of not preventing dental caries – costs, morbidity and mortality
- The strength of evidence on the efficacy of (and problems associated with) alternatives to water fluoridation
- The nature, effects and degree of aesthetic impact of dental fluorosis

2.3.6 What is most important to the public?

The common sense view is that benefits should outweigh the risks. Both preventive benefits and potential harms must be set out clearly and consistently to avoid confusion and mixed messages to the public. Of course, the public may view the potential harm as more significant than the benefits, even

though the numbers involved might be much smaller; people may feel that they are being asked to compare apples and oranges.

In the USA a decade ago the concept was advanced that the public's perception of health risk was influenced more by potential 'outrage' than by the magnitude of the potential risk. A series of strategies was advocated for reducing outrage (through information provision), as it was felt that the public could not make informed decisions in the presence of outrage (Sandham, 1990). A Canadian telephone survey of 2000 people living in fluoridated and non-fluoridated municipalities in 1998 indicated that in both areas knowledge about caries preventive benefits was low and knowledge about dental fluorosis was very low. The authors concluded that there was still a need for public health education on the uses of fluoride (Levallois et al., 1998). There are a number of market research reports on public opinion (including one in Anglesey after water fluoridation was withdrawn) that might be informative (Hulse et al., 1995).

2.3.7 Implications for prioritising research on fluoridation

There are several areas where further information could help the public make informed decisions:

Clarity is required about the prevalence of different forms of dental fluorosis. It is important to separate out discussion on the mild and moderate forms from the rare severe form.

The role of impacts on tooth mineralisation **not** associated with water fluoridation also needs clarifying. Many aesthetic defects are caused by other insults and fluoride related opacities may be associated with over-use of topical products rather than sustained low dose acquisition through water.

More robust information on the potential harms of fluoridation is needed.

In addition, knowledge is needed on the public perception of the aesthetic impairment associated with different types of dental fluorosis. There is some evidence from large population samples (Scottish Health Board's Epidemiological Programme 1991–2000: Pitts et al., 1993, 1995, 1997, 1999) that children are unaware of much of what dentists may score as mild or moderate fluorosis. For example, of 5,981 14-year-old children examined in non-fluoridated Scotland, 750 had a degree of fluorosis like defects recorded by dental examiners. However only 45 (0.75% overall) of these were judged by dentists to be of noticeable aesthetic impact and were noticed by the children themselves. Other work is being carried out using lay 'juries' to assess photographs of different severities of fluorosis.

As a more general point, scientists undertaking research in this area (and those commissioning it) should build in provision for public engagement. They need to be sensitive to the needs of the public and the results of such work must be communicated in a way that can be readily understood.

2.4 Research recommendations

Further work in this field should cover four main areas:

- Research to evaluate methods for gauging public opinion, specifically on issues relating to water fluoridation.
- Increased understanding on how to engage the public more effectively when planning research.
- Research to assess methods for communicating scientific results to the public.
- Improved involvement of public opinion in reaching policy decisions.

Some such work is already in progress or has taken place (eg Hughes & Lawther, 1993).

2.5 References

Hughes K & Lawther S (1993) Northern Regional Health Authority – Pretest of the Water Fluoridation Leaflet (Final Report), Strathclyde, Centre for Social Marketing, University of Strathclyde

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Levallois P, Grondin J & Gingras S (1998) Knowledge, perception and behaviour of the general public concerning the addition of fluoride to drinking water. Canadian Journal of Public Health, 89, 162-165

Lowry RL, Thompson B & Lennon MA (2000) How much do the general public want to be involved in decisions on implementing water fluoridation? British Dental Journal, 188, 500-502

Pitts NB, Fyffe HE, Nugent Z & Smith P (1993) Scottish Health Board's Dental Epidemiological Programme. Report of the 1992/93 Survey of 12 year old children. Dundee, University of Dundee

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3. Total fluoride exposure and uptake

In order to assess the specific benefits and/or hazards that might arise from the fluoridation of water, it is necessary to take account of the different sources and routes of human exposure to fluoride and to understand the absorption, distribution and metabolism of fluoride in the human body. This information is relevant for several reasons:

- Estimates of the impact of water fluoridation on total exposure to fluoride may otherwise be inaccurate or misleading.
- The effects of water fluoridation might be confounded or modified by exposure to fluoride from other sources.
- If other sources of fluoride are important determinants of total dose in some individuals, they might be a useful focus for epidemiological studies that could help to inform risk assessment.
- If the bioavailability of ingested fluoride can vary significantly, this might need to be taken into account in the interpretation of epidemiological studies.
- Knowledge of the distribution and metabolism of fluoride may provide pointers to the measures of exposure (eg recent or cumulative) that are most relevant to different health outcomes, and to the plausibility of effects in different tissues.
- It may enable the establishment of useful biomarkers of internal dose for use in epidemiological studies of health effects.

3.1 Uptake, distribution, metabolism and excretion of fluoride

The main route of fluoride absorption is through the gastrointestinal tract, although inhalation may be a relevant route of exposure in certain industrial situations.

Following ingestion, the fluoride ion is readily absorbed – primarily from the stomach and also the small intestine. Peak plasma levels normally occur during the first hour after ingestion. If the amount of fluoride ingested is small (no more than a few milligrams) soft tissue fluoride levels normally decline to those before ingestion within 3 to 6 hours. The degree of absorption of fluoride from ingested sources is influenced by a number of factors, some of which are poorly understood (Whitford, 1996). When a readily soluble compound such as sodium fluoride is ingested with water, nearly all the fluoride may be absorbed. If the fluoride is taken with milk or food, however, then the degree of absorption is reduced because of the formation of insoluble complexes or precipitates. High calcium content of co-ingesta (food and drink ingested at the same time) can further reduce the absorbed dose, and the pH of the stomach can influence fluoride absorption. The more acid the stomach, the more fluoride will be absorbed (Whitford, 1996).

The question of the bioavailability of ingested fluoride is important, especially with respect to the possible influence of water hardness on uptake and differences between naturally fluoridated and artificially fluoridated water. Inorganic ions in the water certainly can interfere with fluoride absorption, but at the 1 ppm fluoride level this interference is biologically insignificant in normally composed drinking water. Only at high concentrations of calcium, magnesium and aluminium ions is fluoride absorption effectively reduced, owing to formation of less soluble complex fluorides (Cremer & Buttner, 1970). Considering possible differences in bioavailability between naturally fluoridated and artificially fluoridated water, Cremer and Buttner (1970) concluded that "fluorides that either occur naturally in water or are added to communal supplies…to increase the fluoride level to 1ppm F, yield fluoride ions which are almost completely absorbed from the gastrointestinal tract"; however, this is an area of some uncertainty and debate, and requires further study.

The fluoride ion is primarily distributed in the body via plasma. The quantitatively most important fates of absorbed fluoride are uptake by calcified tissues and excretion in the urine (with a small amount excreted via sweat and faeces). On average, about half the absorbed amount is excreted in the urine, though this proportion varies considerably, and approximately 97-99% of the retained fluoride in the body becomes associated with bone and other calcified tissues (Hillier et al., 1996). However, the fluoride

of calcified tissues is not irreversibly bound, and if fluoride intake is reduced over a long enough time course the concentrations in bone, etc. will eventually reflect this change through the mobilisation of bound fluoride. Within the soft tissues of the body, fluoride rapidly establishes a steady state distribution between extracellular and intracellular fluids (Whitford, 1996).

3.2 Sources of fluoride exposure

The major potential sources of ingested fluoride are water and other dietary sources (including food and drinks prepared with fluoridated water), fluoride tablets and drops and other supplements (more relevant in the USA and elsewhere than in the UK), and unintentional ingestion of fluoridated toothpaste, especially by children, or fluoride mouth rinses. In addition, some individuals are exposed to fluoride occupationally, or receive therapeutic doses of fluoride (for example in the treatment of otosclerosis and osteoporosis).

Up until the 1960s, the ingestion of fluorides from water (whether natural or supplemented) probably represented the bulk of fluoride exposure for both adults and children in most populations (Murray et al., 1991)[3]. Since then, however, the availability of fluoride from other sources has changed significantly, and fluoride in drinking water is now recognised as just one component of an individual's total fluoride intake. For example, in the 1970s fluoride started to be added to toothpastes and by 1978 96% of toothpaste on the market contained fluoride, usually at a concentration of 1000 to 1500ppm (though it should be noted that in the UK lower fluoride toothpastes containing about 500ppm fluoride are now available for use by children).

The contribution of fluoride in drinking water to total intake varies with the concentration of fluoride in the water. In UK fluoridated areas, drinking water probably remains the most important source of fluoride intake. The relative importance of fluoridated toothpaste as a source of ingested fluoride is greater for young children than for adults because of their greater propensity to swallow it (see section below on fluoride intake in children).

3.3 Biomarkers of fluoride exposure (absorbed dose)

The most important markers of exposure are measured fluoride levels in plasma, urine and bone. Bone provides a measure of cumulative exposure and is probably the best guide to long-term uptake. However it can be difficult to obtain and is not practical for large-scale studies or routine clinical situations. The sampling is invasive and the type/site of bone sampled (usually iliac crest) has to be standardized, as fluoride concentration varies throughout the skeleton. Plasma levels give the best practicable indication of recent fluoride intake; fluoride levels in saliva reflect those in plasma (Jenkins, 1978; Whitford, 1996).

Although a useful marker of absorbed dose, urinary excretion of fluoride is of somewhat limited value for estimating fluoride ingestion because of variation in the proportion of ingested fluoride that is retained, which depends mainly on the level of fluoride intake. For example, in children with low fluoride intake, the proportion that is excreted in the urine is high, and negative balances can occur (see below). A further note of caution on urine fluoride measurement relates to the fact that fluoride excretion is dependent on the pH of the urine. Thus, for example, acidic urine associated with high altitude inhibits fluoride excretion while alkaline urine associated with a vegetarian diet increases fluoride excretion. There also appear to be age-related differences in the proportion of ingested fluoride that is excreted in the urine. Nevertheless, urinary fluoride measurements can be useful markers of recent exposure – especially if 24-hour samples are used – and are particularly valuable in comparative studies of groups of people (eg communities receiving fluoridated water versus those receiving fluoridated salt or milk). They can also be of value in identifying people with probable high fluoride intake, especially if sampling periods of 6 days or more are used.

3 With two exceptions; workers in industries handling fluoride concentrates, and osteoporosis patients given high fluoride doses therapeutically.

Fluoride levels in nails have also been used as a biomarker of fluoride exposure, but are not well standardized against bone or plasma concentrations. Nail fluoride level reflects intake about three to six months before.

3.4 Total exposure studies

A number of studies have attempted to estimate the mean daily intake of fluoride, using a variety of techniques[4]. Most have found intakes of 0.01 to 0.13 mg/kg bw, with most mean intake values between 0.03 and 0.04 mg/kg bw in non-fluoridated areas and 0.04 to 0.06 mg/kg bw in fluoridated areas. However, several studies have found considerable variation, especially in children among whom individual intakes may far exceed the mean value, owing to ingestion of dentifrice, for example (Warren & Levy, 1999).

Table 2 presents an example estimate of daily fluoride intake for adults and children, adapted from Hamilton (1992).

Table 2: Daily fluoride consumption from drinking water, tooth brushing and diet

Source	Concentration/Content	Intake (mg/kg bw)[a]	
		Child	Adult
Drinking water[b]	1.2 mg/l	0.084	0.034
Tooth-brushing and mouth washing	0.145-0.66 mg	0.033	0.002
Diet	0.2-0.4 mg	0.010	0.006
Total intake		0.127	0.042

a Assuming child and adult weights of 20 and 70kg, respectively, together with 100% absorption.
b Assumes child and adult water consumption of 1.4 and 2.0 l/day (likely to be an overestimate for the present day).
Adapted from Hamilton, 1992.

Estimates of fluoride intake by children and adults in fluoridated and non-fluoridated areas have been made by the Australian National Health and Medical Research Council (NHMRC, 1999). They compared the optimal total daily intake of fluoride recommended by the American Academy of Paediatrics (0.05-0.07 mg/kg bw) with estimates of intakes in fluoridated and non-fluoridated areas. The conclusions of the NHMRC were that breast-fed infants under six months in fluoridated and non-fluoridated areas are likely to have 'sub-optimal' intakes of fluoride. The same is true of breast-fed infants of any age in fluoridated areas, who do not use fluoridated toothpaste. Individuals most likely to have supra-optimal fluoride intakes are formula-fed infants in fluoridated areas, infants in non-fluoridated areas fed on high fluoride containing formula, and individuals with excessive toothpaste use and ingestion.

The various available methods for estimating fluoride ingestion have their own particular qualities concerning difficulty and accuracy. Methodological considerations are therefore most important when evaluating and interpreting results from studies of fluoride ingestion, particularly with regard to sample size and measurement period because of individual and temporal variability in intake[5]. Estimates of fluoride ingested from all sources are likely to be imprecise owing to the variation in individual consumption patterns and the differing concentrations of fluoride in foods and beverages. Accurately quantifying fluoride intake from current and past use of water[6], food, and toothpaste, etc., together with

4 Various methods are available for estimating fluoride ingestion, including retrospective questionnaires, diet diaries, market basket surveys and the "duplicate plate" method.

5 There is a tendency to misinterpret extreme values (for fluoride intake or excretion, for example) from epidemiological surveys; typically, the highest and lowest values recorded are highlighted without regard to the method used to obtain these values. Often one-day records (or worse - less than one day samples) are obtained and presented as the variability between subjects in a population. This ignores intra-subject variation and therefore overestimates the range of intake between individuals.

6 Tap water intake, especially by children, is commonly grossly overestimated. Rugg-Gunn et al. (1987) showed tap water intake (all sources) to be just 616g (0.616l)/day on average (cf estimate by Hamilton, 1992, of 1.4l/day). Because of variability in intake, an averaging sampling period of at least 6 days is recommended (Rugg-Gunn, 1987).

past intake from supplements or infant formula, is certainly very difficult and such estimates must therefore be treated with caution.

3.5 Further information on fluoride intake and excretion in children

The annex (page 44) gives design details and key results from a number of important studies on fluoride intake and excretion in children, together with the authors' conclusions. Various methods were used to measure excretion, but all but one study quoted here used duplicate diet collection for the intake estimates.

The results confirm that some children may be in negative fluoride balance (Ekstrand et al., 1984). This was found to be the case for breast-fed babies, in contrast with formula-fed babies who retained between 52 and 61% of the range of 891 to 1012 mg they consumed per day. In New Zealand in children aged 11 to 13 months the mean intake was found to be 0.028 mgF/kg bodyweight in a fluoridated area and 0.009 mgF/kg bw in a non-fluoridated area. When toothpaste was added the figures were 0.033 and 0.02 mgF/kg bw. The authors concluded that the intakes were within recommended limits although some children might be pushed above these if they used excessive amounts of toothpaste or supplements (Chowdhury et al., 1990). Another study by the same principal author found similar results in older children (Guha-Chowdhury et al., 1996). A study conducted in Japan, where there was very limited access to any fluoridated products but a potentially higher dietary fluoride level, found intakes to be between those of Americans living in fluoridated and in non-fluoridated areas (Kimura et al., 2001). No study produced evidence to suggest that any group was consuming too much fluoride, although Rojas-Sanchez et al. (1999) have cautioned that attention needs to be given to the daily intake of fluoride by young children in both fluoridated and non-fluoridated areas to prevent them being put at risk of developing dental fluorosis.

With regard to excretion, a detailed study by Villa et al. (2000) reported that the proportions of ingested fluoride excreted varied between 24.4% and 62.6%, with a mean of 35.5%. This study was undertaken in an orphanage and the diet of all the children was relatively similar, so the variation in excretion is particularly interesting.

Results of two large studies on both children and adults, to be published shortly, are expected to provide important information on urinary fluoride excretion and allow further improved estimates of total exposure to be made.

3.6 Gaps in the evidence

Research into the health effects of fluorides, driven by public health interest in the artificial fluoridation of water, has hitherto centred almost entirely on the fluorides ingested from water, and there is therefore considerable information regarding the impact of water fluorides on the general population, usually without regard to other sources. Smaller bodies of research have focused on workers in industries handling fluoride concentrates and osteoporosis patients given high fluoride doses therapeutically. Data from such high-exposure situations, in which normal domestic fluoride intake is dwarfed, provide useful information on the relation between fluoride intake and accumulation in bone, at least at high levels of exposure. Estimates of total dietary fluoride intake for the normal population have generally been made by applying mean fluoride concentrations in foodstuffs to food consumption data from periodic nutritional surveys.

As previously recounted, developments since 1960 have altered the general pattern of fluoride exposure and may have created a new situation in the population at large, both with respect to total exposure and the main sources of exposure. There are therefore several deficiencies in the existing body of evidence when evaluating effects relating to fluoride exposure, and other questions that need to be addressed:

The effects of fluorides are probably related to total exposure, not just fluoride in drinking water. There are very few data relating total fluoride exposure to health effects.

Contributions to total exposure by inhalation of airborne pollutants (which can readily be estimated) and trans-dermal absorption from cosmetics and from bathing in fluoridated water are assumed to be small in the general population but have not been quantified empirically.

Estimation of total fluoride exposure by addition of the average intakes from foods, drinks and water may be overlooking important secondary sources.

In addition to mean values and confidence limits, there is a need for frequency distributions of fluoride exposure to enable the identification of individuals or groups exposed to levels considerably higher than the mean. These subgroups could then be the subject of further investigation.

With regard to dental caries and fluorosis, fluoride has a relatively low 'therapeutic ratio' (the ratio between biologically effective dose and toxic dose). There is a need to address the aggregate rate of accumulation of fluoride in target tissues and assess whether this is fast enough to incur the risk of pathology within a reasonable life span in more than a small (and defined) minority of those exposed.

In children, there have been too few studies of total fluoride intake and the contribution of various sources to that intake. The reason has been, largely, because the issue under consideration has been the effect of different levels of fluoride in water, which has usually meant comparisons between areas. Nevertheless, there is a need for further information, especially when linked to fluoride retention and excretion.

Population groups exposed to high levels of fluoride, such as some foundry workers (having increased consumption of fluoridated drinking water) or those employed in aluminium smelters (being occupationally exposed to fluoride), could be studied to address specific questions relating to the risks of high fluoride intake.

A major area of uncertainty concerns the bioavailability of fluoride. This is particularly important with respect to the possible differential absorption of fluoride from naturally and artificially fluoridated water and the role of water hardness (calcium levels).

3.7 Conclusions and research recommendations

In studies of water fluoridation and health, there is potential for confounding or effect modification by sources of fluoride exposure other than water and this needs to be better understood. Questions remain about fluoride bioavailability and also about the most appropriate exposure/dose markers to use in particular studies. It is important to understand the relative importance of different sources of fluoride exposure in children, adults and special occupational groups, and to track trends that occur over time. It is possible that studies of individuals occupationally exposed to fluoride could provide useful additional information on the uptake, absorption, excretion and health effects.

Principal recommendations pertaining to fluoride exposure are as follows:

- New studies are required to investigate the bioavailability and absorption of fluoride from naturally fluoridated and artificially fluoridated drinking water, looking also at the impact of water hardness. This is particularly important because if the bioavailability is the same, many of the findings relating to natural fluoride can also be related to artificial fluoridation.
- Further attempts should be made to calculate lifetime intakes of fluoride, using both urinary and ingestion data, and to determine the relative contribution of fluoride in artificially fluoridated water to total fluoride uptake. If the bioavailability of artificial and natural fluoride were found to be the same, then studies on people who have lived in naturally high fluoride areas could be informative.
- Continuing information is needed on trends in fluoride exposure resulting from changes in the use of discretionary fluorides (eg toothpaste use by infants). The survey of the use of discretionary fluorides by 1.5 to 4.5 year old children included in the National Diet and Nutrition Survey (Hinds & Gregory, 1995) should be repeated.

- If the bioavailability of fluoride from artificially fluoridated water is found to be substantially greater than from naturally fluoridated water, then new studies should address the rate of accumulation of fluoride in target tissues from artificial fluoridation and assess whether this is fast enough to produce a risk of pathological change within a reasonable life span in more than a small (and defined) minority of those exposed.

Within the National Diet and Nutrition Survey, 24 hour urine samples are being collected for fluoride analysis. Additional recommendations for future research will depend to some extent on whether the results are in line with existing estimates of total fluoride intake.

Whatever the outcome it is suggested that:

- Periodic 24 hour urinary fluoride sampling should remain a feature of at least some national diet surveys, to monitor on going trends and particularly to look at fluoride intake across the population.
- Fluoride ingestion (from all sources) and fluoride excretion, and therefore fluoride retention, should be measured in children.
- The relative importance of water as a source of fluoride ingestion in children should be determined.

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4. Principal health outcomes

4.1 Dental caries

The York Review (NHS CRD, 2000) focused particularly on the effects of fluoride on dental caries. The review found that water fluoridation was effective in reducing dental caries, and that the reduction in dental caries experience is greater in those areas with higher levels of dental caries prior to water fluoridation. The change in the prevalence of dental caries was an estimated 15% increase in the proportion of subjects with no dental caries and a decrease of 2.2 in the mean number of decayed, missing or filled teeth (dmft/DMFT)[7]. However, due to the variability between reported studies it was not possible to be precise about the size of these effects. In particular, many studies had failed to take sufficient account of confounding factors. The only two studies that were designed as true cohort studies were not included in the meta-regression analysis because they used different outcome measures from the other studies.

In considering the effects on dental caries the York Review looked only at those studies presenting baseline and follow-up data for both fluoridated and non-fluoridated communities. Furthermore, it considered only two outcome measures: differences in percentages of caries free children, and absolute differences in caries experience (ie differences in dmft/DMFT). The York Review did not consider all studies or all possible outcome measures relating to dental caries; for example it did not include:

- outcome measures such as the percentage of children with high dmft/DMFT, extracted teeth, experience of general anaesthesia for dental extraction, toothache, and point prevalence of dental abscesses;
- cross-sectional studies (for social class analysis) - including important studies on dental caries in adults; or
- long term dental effects in communities with naturally fluoridated drinking water..

4.1.1 Relevant studies

Other reported studies, such as cross-sectional studies conducted in the UK between 1980 and 1990, have shown reductions in dental caries due to fluoride of the same order of magnitude as those reported in the York Review (Rugg-Gunn et al., 1977; French et al., 1984; Duxbury et al., 1987; Mitropoulos et al., 1988; Rugg-Gunn et al., 1988; Carmichael et al., 1989; Seaman et al., 1989). These studies also reported additional effects, such as reductions in the prevalence of both toothache and dental treatment needing general anaesthesia.

In addition, studies have found a reduction in dental caries by water fluoridation in children as young as 3 years of age (Booth et al, 1992) and in adults (Murray, 1971; Newbrun, 1989; Thomas & Kassab, 1992; O'Mulane & Whelton, 1992), even up to 75 years of age (Hunt et al., 1989). Water fluoridation has an important post-eruptive topical effect; a study by Hardwick et al. (1982) found that children aged 12 years at the initiation of fluoridation showed significant benefits within three to four years.

It should be noted that there is difficulty in accurately measuring and predicting the beneficial effects of fluoridation. For example, fluoride may be incorporated into some foods and drinks manufactured in a fluoridated area and subsequently transported to and consumed by residents in a non-fluoridated area. This has the effect of reducing the observed differences in dental caries between fluoridated and non-fluoridated communities, which may cause an underestimation of the benefits of water fluoridation (Griffin et al., 2001). Furthermore, many epidemiological studies have recorded only frank carious lesions and are therefore likely to have underestimated the true prevalence of disease (Pitts & Fyffe, 1988).

4.1.2 Implications

The reduction in sugar consumption in UK children since the 1960s and the introduction of fluoride toothpaste in the 1970s led to substantial reductions in dental caries (Todd & Dodd, 1985). However, these reductions were not uniform and led to widening social inequalities in children's dental health.

7 dmft: mean number of decayed, missing or filled teeth in the deciduous dentition (first teeth)
DMFT: mean number of decayed, missing or filled teeth in the permanent dentition

Minority ethnic groups, particularly young children of Muslim non-English speaking mothers, have been shown to be at particularly high risk. Inequalities persist into adult life and are not improving over time (Kelly et al., 2000). The British Dental Association has suggested that water fluoridation should be targeted to high risk communities in order to try to reduce the widespread geographical and social inequalities in dental health.

A report by the York Health Economics Consortium (Sanderson, 1998) commented that the effectiveness of water fluoridation would depend upon the baseline level of caries, and that the capital costs were sensitive to economies of scale. This report suggested that water fluoridation should be targeted at those districts with mean dmft at age 5 years greater than 2.0 and with water supply schemes covering around 200,000 residents.

4.1.3 Research recommendations

The York Review concluded that water fluoridation was effective, but the authors were reluctant to estimate the likely impact in today's environment. Therefore, to inform policy, future research - including economic evaluation - should determine the short-term impacts of water fluoridation on dental caries (ie within 4 years of implementation), though there would be advantages in extending studies to 10 years and beyond in order to capture more fully the effects on the permanent dentition.

Specific recommendations are as follows:

- Further studies (eg prospective intervention studies) are needed in population groups with higher levels of dental caries that i) provide an estimate of the effect of water fluoridation on children aged 3-15 years against a background of widespread use of fluoride dentifrices, and ii) extend knowledge about the effect of water fluoridation by social class (or other relevant measures of socio-economic status) taking into account important potential effect modifiers such as sugar consumption and toothpaste usage.
- Further information is needed on the impact of water fluoridation on recurrent caries in adults and root caries in older adults, controlling for age, social class, ethnic group, sugar consumption and use of discretionary fluorides.
- There is a need to extend understanding of the impact of fluoridation on quality of life and economic indices, in addition to the more customary outcome measures based on the extent of decayed, missing and filled teeth.

4.2 Dental fluorosis

Dental fluorosis is a form of developmental defect of tooth enamel. Histologically it presents as a hypocalcification, while clinically it ranges from barely visible white striations on the teeth through to gross defects and staining of the enamel. There are around 90 different causes of enamel defects of which three or four causes are common. Differential diagnosis is not straightforward, and therefore in epidemiological studies, inter- and intra-examiner variability remains a problem. Minor forms of dental fluorosis are not aesthetically troublesome and may even enhance the appearance of dental enamel (Hawley et al., 1996).

The York Review identified 88 studies (mainly cross-sectional) investigating dental fluorosis, from 30 countries, which suggested a prevalence (all levels of severity) of 48% in fluoridated areas and 15% in non-fluoridated areas. Limiting consideration to aesthetically important levels of severity, the York Review reported the prevalence of fluorosis to be 12.5% in fluoridated areas and 6.3% in non-fluoridated areas. For any given fluoride concentration in water the prevalence of aesthetically important dental fluorosis was higher in naturally fluoridated areas than in artificially fluoridated areas. A sensitivity analysis excluding data points above 1.5ppm fluoride found prevalences for all levels of severity of 46% and 18% and for aesthetically important dental fluorosis of 10% and 6% in fluoridated and non-fluoridated areas respectively. The York Review suggested that there was a dose-response relationship and that most studies failed to take full account of confounding factors. However, the York Review included studies in countries with hotter climates than the UK: in hot climates, water intake is typically higher than in the UK and the risk of fluorosis correspondingly greater for any given water fluoride concentration (Murray, 1986).

4.2.1 Relevant studies

In the UK, the prevalence of aesthetically important dental fluorosis is probably lower than that reported in the York Review. For example, a study by Tabari et al., (2000) found prevalence of fluorosis (in upper permanent incisor teeth) to be 3% in fluoridated Newcastle and 0.5% in non-fluoridated Northumberland. An EU BIOMED funded study (O'Mullane et al., 1999) reported the prevalence of aesthetically important fluorosis (based on photographic diagnosis) in seven European countries, including the UK. Results are reported in Table 3. Only in Cork was the drinking water artificially fluoridated.

Table 3: Prevalence of aesthetically important fluorosis in seven European countries

	Number of children photographed	Prevalence of aesthetically important fluorosis (TF?3)
Cork (Ireland) Fluoridated	325	4%
Knowsley (UK)	314	1%
Haarlem (Netherlands)	303	4%
Athens (Greece)	283	0%
Almada (Portugal)	210	1%
Reykjavik (Iceland)	296	1%
Oulu (Finland)	315	0%

a The 'TF' index of dental fluorosis is named after Thylstrup and Fejerskov who developed it (Thylstrup & Fejerskov, 1978)

Source: EU BIOMED study, report to EU dated July 1999 (O'Mullane et al., 1999)

The British Society for Paediatric Dentistry has published guidelines that indicate that discretionary fluorides are an important aetiological factor for dental fluorosis, and recommends that children at low risk of caries should use a small pea sized amount of lower fluoride toothpaste under parental supervision. Fluoride tablets and drops should not be prescribed routinely (Holt et al, 1996). A National survey for 1½ - 4½ year olds and a recent study in the North East of England both indicated that these recommendations were being heeded by significant numbers of parents (Hinds & Gregory, 1995; Tabari et al., 2000). The latter study found that the use of low fluoride toothpaste in infancy was related to a lower prevalence of dental fluorosis in upper permanent incisor teeth.

A higher incidence of dental fluorosis has been reported in children in the USA compared with the UK. However, studies have suggested that 7 to 36% of children living in fluoridated US communities may also be receiving fluoride supplements inappropriately prescribed by their physician or paediatrician (US Department of Health and Human Services, 2001), which could contribute to the higher prevalence values reported in the international data. In addition, low fluoride toothpastes have not been marketed in the USA.

4.2.2 Research recommendations

There are discrepancies between the dental fluorosis data reported by the York Review and recent data from the UK and Europe (detailed above). The public's awareness and understanding of fluorosis is, in general, low. Any future research should aim to provide further understanding of both these two aspects. Further methodological work is needed to validate the Thylstrup-Fejerskov (TF) index of dental fluorosis using histological appearance as the validating criterion.

Specific recommendations are as follows:

- Cross-sectional studies to determine the current prevalence of dental fluorosis in fluoridated and non-fluoridated communities. Photographic techniques are recommended, with careful attention to examiner training, calibration and blinding. Due regard should be given to potential confounding factors and/or effect modifiers such as social class, ethnic group and the use of discretionary fluorides.
- Further studies should determine the public's perception of dental fluorosis with particular attention to the distinction between acceptable and aesthetically unacceptable fluorosis.
- Any prospective epidemiological studies of fluoridation and dental caries should incorporate dental fluorosis as one of the outcome measures.

4.3 Effects of social class

As for many diseases in the UK, dental caries is more prevalent in the more deprived social groups than in more affluent social groups (Beal, 1986). This is especially marked in the primary dentition of young children. High prevalences of toothache, abscesses and dental extractions needing general anaesthesia are associated with the high caries experience recorded in children in deprived social groups in the UK (Rugg-Gunn et al., 1977; O'Brien, 1994; Hinds & Gregory, 1995). The two principal factors influencing dental caries are diet and the use of fluoridated dental care products (especially toothpaste). Diets of more socially deprived children are more caries conducive than diets of more affluent children, and more affluent children brush their teeth with a fluoride toothpaste more often than do more socially deprived children (Hinds & Gregory, 1995).

Water fluoridation has advantages over other possible caries preventive measures in that it reaches everyone in a community who is on a public water supply. It is therefore seen as an equitable public health measure, and there has been considerable interest in the question of whether water fluoridation benefits most those people at greatest risk of dental caries, ie the more deprived members of a community. If so, water fluoridation could be an important means of reducing inequalities in oral health.

This issue was examined in Chapter 6 of the York Review. That report identified and examined results of fifteen studies, published between 1969 and 1999, investigating the associations between water fluoridation, dental caries and social class. The search was limited to the UK – one study was conducted in Wales, the remainder in England. The Review commented that the number of studies in the UK (fifteen) was very small and that the quality of the evidence from the studies was low – all but four were classed as quality level C, the remainder being level B[8]. In the majority of studies, children were classed socially using the UK Registrar General's classification. For these analyses, two measures of dental caries were used – the percentage of children caries free (the reverse of caries prevalence) and mean dmft/DMFT.

Although there was no evidence that water fluoridation reduced the caries prevalence/social class gradient overall, the York Review did find some evidence that water fluoridation reduces inequalities in dental health across the social classes in 5 and 12 year old children, using the dmft/DMFT measure. This effect was not seen in the proportion of caries free 5 year olds. There were insufficient data for the other age groups to be assessed. Regression analyses in two studies (which used methods other than the Registrar General's system for classifying children socially) indicated that children in the more deprived areas achieved greater reductions in tooth decay than children in less deprived areas.

The York Review concluded that there appears to be evidence that water fluoridation reduces the inequalities of dental health across the social classes in five and twelve year olds, using the dmft/DMFT measure. This effect was not seen in the proportion of caries free children among five year olds; the data on caries prevalence in children of other ages also did not demonstrate an effect. The Review suggested caution in interpreting these results because of the small quantity of studies, differences between the studies, and their low quality rating.

A number of authoritative reports have commented on this issue. When discussing inequalities in health in the UK, Acheson (1998) said, "Fluoridation of the public water supply has been shown to reduce dental caries, especially amongst socially deprived communities in the UK and Australia. Water fluoridation provides benefits for everyone but the effects are more pronounced in people in lower social classes, particularly in the primary dentition". In a report to the Canadian Health Ministry, Locker (1999) said "Moreover, the absolute differences in dmft/s or DMFT/S[9] scores between populations living in fluoridated and non-fluoridated communities is consistently larger in lower socio-economic status (SES) children than in higher SES children. Expressed another way, the difference in caries rates between children from the upper and lower SES groups is narrower in fluoridated than in non-fluoridated communities. This points to an additive interaction between water fluoridation and SES. However, the

8 See York Review page 5. Level B is defined as evidence of moderate quality, level C as evidence of lowest quality.

9 s or S refers to surfaces rather than teeth (t/T)

magnitude of this effect is more pronounced in the deciduous dentition and is generally small". A recent report of the US Centers for Disease Control and Prevention, stated that "Water fluoridation also reduces the disparities in caries experience among poor and non-poor children… Thus, these persons might receive more benefit from fluoridated community water than persons from high SES strata" (US Department of Health and Human Services, 2001).

While higher caries experience in more deprived communities is a common finding in developed countries, this is not so in less well-developed countries. Studies in West Africa, for example, have reported higher caries experience in children from affluent families (due to their ability to purchase high sugar snack foods and drinks; Olojugba & Lennon, 1990). In the UAE, dental caries experience of children was positively related to parental income, but negatively related to parental education (Al-Hosani & Rugg-Gunn, 1998).

4.3.2 Studies conducted outside the UK

Because of the limited data available in the UK to investigate whether water fluoridation reduces social inequalities in dental health, a search was made for studies conducted outside the UK. For reasons alluded to above, this search was limited to the USA, Canada, Europe, Australia and New Zealand. Two studies were located in Australia, five in New Zealand and two in Finland. These nine studies are reviewed below, together with a study validity assessment grade based on the York Review criteria (see Appendix D of the York Review for details). As with the UK studies, the quality of studies was low: all nine studies were graded as 'C' level. No prospective studies were identified.

Brown et al. (1990) reported on the caries experience of eight-year-old children in fluoridated Melbourne and non-fluoridated Geelong, Australia. The results indicated that water fluoridation was able to reduce some of the influence of social class on dmft. [Validity score = 1.0]

Slade et al. (1996) described a study of caries experience of 6,704 Queensland children aged five to twelve years old and 6,814 South Australia children aged five to fifteen years old. Both areas included children exposed or not exposed to water fluoridation. The authors concluded that 'SES inequalities were more pronounced among children who had no exposure to fluoridated water, most probably because of the higher underlying levels of caries experience of children with no exposure to fluoride in the water. Water fluoridation, therefore, has the dual appeal of reducing caries levels among children and, in doing so, reducing SES inequalities in caries experience'. Substantial additive effects were observed, but the multiplicative effects were weak in this study (Spencer et al. 1996). [Validity score = 1.8]

Evans et al. (1984) reported caries experience of five-year-old children (primary teeth) living in Dunedin, New Zealand, which had fluoridated its drinking water in 1967. Statistically significant differences were reported for the effects of both fluoride and SES in analyses of variance. The absolute difference in caries experience between fluoridated and non-fluoridated areas was very much greater in the low SES groups than in the high SES groups. The small cell size (number of subjects for a sub-group analysis) indicates a need for caution in interpreting the results. [Validity score = 0.8]

Colquhoun (1985) examined the statistics of treatment provided to children in Auckland, which had fluoridated in 1966, and a non-fluoridated area. He reported that fifteen years after water fluoridation began in Auckland, there was still a significant correlation between dental treatment requirements of children and their social class. He concluded that 'What is clear from this study is that in Auckland, New Zealand, levels of child dental health are more related to socio-economic factors than to water fluoridation'. Thus, he dismissed the effectiveness of water fluoridation. [Validity score = 0.8]

Fergusson and Horwood (1986) related social background, water fluoridation and the use of fluoride tablets to caries experience (dmft) of a birth cohort of seven-year-old children in Christchurch, New Zealand. The authors concluded that 'In common with the findings of many other studies, there was an inverse relationship between social background and dental health, with increasing social disadvantage being associated with decreasing dental health. However, this association was not particularly strong and it was estimated that, jointly, variation in social background conditions explained only 4% of variation in

dmft scores'. 'Finally, the results suggest that fluoride tablets, social background and residency in a fluoridated area all had significant effects on dmft scores'. [Validity score = 1.8]

Treasure and Dever (1992) examined 147 children aged five years in fluoridated Ashburton and Dunedin, New Zealand, and 195 children of the same age in non-fluoridated Oamaru and Timaru. The authors reported that 'The children in the fluoridated towns showed only minor variations when caries data were analysed by socio-economic status. In contrast, in the non-fluoridated sample, there was a marked social gradient with less-advantaged children having a higher mean dmft'. [Validity score = 1.0]

Treasure and Dever (1994) recorded the caries experience of fourteen-year-olds (permanent teeth) living in three areas – continuous fluoridation, non-fluoridated and an area that had discontinued fluoridation five years previously. The main effects of SES and water fluoridation were statistically significant. Differences in caries experience between the high and low SES groups were greater in the non-fluoridated than in the fluoridated area. Considerable caution in interpreting these data is necessary, due to small cell sizes. [Validity score = 1.0]

Hausen et al. (1981) reported on a survey of the permanent teeth of 2,778 seven to sixteen year-old children living in fluoridated and non-fluoridated areas of Kuopio County, Finland. They concluded that 'Caries frequency is clearly lowest in children of higher social class in both fluoridated and non-fluoridated areas. Differences between middle and lowest social class are, however, small…. water fluoridation has at least some effect in each social class; the effect is of the same magnitude in all social strata'. [Validity score = 0.8]

Hausen et al. (1982) examined the primary teeth of children aged six to nine-years-old living in fluoridated Kuopio and other non-fluoridated areas of Finland. They concluded that 'Children belonging to the highest social class had the lowest caries experience in the primary dentition in naturally high and low fluoridated areas and possibly in areas with fluoridated piped water. The effect of fluoride was similar in all social classes…in Finland, water fluoridation alone is not sufficient to remove differences between social classes in caries in the primary dentition'. [Validity score = 0.8]

4.3.3 Conclusions and research recommendations

There is almost universal agreement that caries experience of children is related to social class. Overall, the balance of evidence is that an additive effect of social class and water fluoridation exists, although this was not found by Colquhoun (1985), and the effect of social class was weak in the two Finnish studies. In the majority of studies water fluoridation reduced dental caries inequalities between high and low social groups; in no study did water fluoridation increase inequalities.

Further studies should be undertaken to address appropriate measures of social inequalities in relation to water fluoridation, dental caries, dental fluorosis and the role of confounding factors such as tooth-brushing with fluoride toothpaste, use of other fluoride therapeutic agents, non-water dietary fluoride ingestion and dietary sugar ingestion. Any such proposed prospective evaluations of water fluoridation and oral health should study communities with an adequate number of people in a wide range of socially diverse groups, and undertake an evaluation of the effect of water fluoridation on the relation between social inequality and dental caries and dental fluorosis with suitable regard to potential confounding factors.

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5. Other potential health outcomes

5.1 Bone health

The York Review included 29 studies on the relation of fluoride in water to bone health. These covered fractures at various anatomical sites, slipped epiphysis and otosclerosis. Eighteen of the investigations provided data on hip fracture. The validity of the studies was generally assessed as low (mean score 3.4 out of 8; see Appendix D of the York Review for details of the assessment criteria) and all but one were classed to the lowest of the three levels of evidence that had been specified at the start of the review.

A total of 55 estimates for the risk of fracture associated with a fluoride concentration of 1 ppm in water was obtained from 20 studies. The relative risks ranged either side of the null value with a pooled estimate from a univariate meta-regression of 1.00 (95% CI 0.94 – 1.06). However, the authors warn that these figures should be interpreted with caution since multivariate analysis revealed significant heterogeneity between the studies.

Two studies of otosclerosis both suggested a beneficial effect of fluoridation, and in a single investigation of slipped epiphysis, fluoride in water was associated with an increased risk in boys and a reduced risk in girls, neither of which was statistically significant.

5.1.1 Potential risk/population effect

Of the potential effects on bone that have been investigated, hip fracture is the most important in public health terms.

In the York Review, the upper 95% confidence limit for the relative risk of all fractures at a water fluoride concentration of approximately 1 ppm was 1.06. Because of the heterogeneity between studies, this figure is subject to some uncertainty. Furthermore, although it was derived largely from studies of hip fracture, some of the data on which it was based related to fracture at other sites. Taking account of these limitations, a reasonable upper bound (ie worst case estimate) for the relative risk of hip fracture from a water fluoride concentration of 1 ppm would be 1.2 (although it is most likely that there is no impact on risk, and there could even be a protective effect).

A relative risk of 1.2 for hip fracture would imply an increase in the lifetime risk of a woman from 14% to approximately 17%, ie an excess risk over a lifetime of about 3%. In men, who have a lower incidence of hip fracture, the excess lifetime risk would be less than 1%. The crude annual incidence of hip fracture in the UK is approximately 1 per 1000 per year.

The epidemiological data currently available do not allow a useful estimate of the potential impact of fluoridation on bone disorders other than fracture, although the few studies that have been carried out to date do not suggest a problem.

5.1.2 Plausibility of effect

An effect of fluoridation on the risk of fracture, adverse or beneficial, is plausible. Fluoridation of water can increase normal dietary intake of the mineral by some 50%, and about half of the fluoride ingested is taken up by bone. Within the bone, fluoride ions can replace hydroxyl ions in the hydroxyapatite lattice with possible implications for its mechanical properties. In addition, elevation of the fluoride concentration in plasma directly increases osteoblastic differentiation and activity.

In theory, a number of other bone disorders could also be affected by these mechanisms. For example, alterations in the hydroxyapatite lattice might influence the development of otosclerosis.

5.1.3 Exposure issues

Many of the epidemiological studies on fluoride and bone health have only assessed risk in relation to current or recent exposure to fluoridated water. However, given the possible mechanisms for an effect on bone, a more relevant metric is likely to be some index of cumulative exposure. This was explored in

a recent MRC case-control study of hip fracture, which found no elevation of risk with exposures to higher fluoride concentrations over a lifetime (Hillier, 2000). A possible limitation of that study, however, was that the exposure to fluoride was almost all from natural sources in water that also contained high concentrations of calcium. It has been proposed that calcium might reduce the bioavailability of fluoride from the gastrointestinal tract, perhaps through ion-pairing, although the importance of any such effect is uncertain (see also Section 3).

Studies of exposure to fluoride in water (especially long-term exposure) are limited by unavoidable inaccuracies in the assessment of individual differences in water intake and of fluoride intake from other dietary sources. In practice, however, these are unlikely seriously to bias estimates of average risks from fluoridation. In particular, confounding by other sources of fluoride in the diet would only have a major impact if total fluoride intake had an important effect on risk (positive or negative), and at the same time, intake from sources other than water differed substantially between fluoridated and non-fluoridated populations.

5.1.4 Gaps in the evidence

The York Review suggests that the evidence base on fluoride and bone health is weak, but this conclusion may be misleading because the criteria by which studies were classified were not entirely appropriate. As outlined above, any effect of fluoride on bone is likely to derive from cumulative exposures, possibly over a lifetime. However, a prime requirement for classification as high level evidence in the review was that studies should have started within three years of the initiation or discontinuation of fluoridation. Any such studies would not be informative about the long-term risk of bone disorders.

A further limitation of the review was that, in grading the validity of studies, it assigned each study a score of zero or one in relation to a pre-defined checklist of features. This is standard practice in systematic reviews, the aim being to make the assessment as objective as possible. However, it has the drawback that the full implications of any weaknesses in the design or execution of individual studies, and the direction of any resultant biases, are not considered.

A broader consideration of the epidemiological evidence on fluoride and bone health suggests that it is of higher quality than the York Review indicates. At this stage, perhaps the most important gap in knowledge concerns the bioavailability of fluoride from different dietary sources, and in particular the influence, if any, of calcium on uptake of fluoride from drinking water (see also Section 3). If fluoride were shown to be much less completely absorbed from hard than soft water, the absence of an increased risk of fracture in some published studies would be less reassuring.

There are also gaps in the evidence base on bone disorders other than fractures, only a few epidemiological studies having attempted to assess risks for any of these diseases directly. However, the gaps could only be regarded as important if there were good reasons to suspect an effect of fluoridation from our knowledge of biochemistry and toxicology.

5.1.5 Feasibility of research

A study to assess the bioavailability of fluoride (see Section 3) from soft as compared with hard water should not be difficult or expensive. If such a study cast serious doubt on the relevance of negative findings from investigations of fracture in relation to water naturally high in fluoride, useful information might be obtained from a well designed case-control study of hip fracture in a population that included people with long-term exposure to artificially fluoridated soft water and others exposed only to low levels of fluoride in water.

In the absence of differential bioavailability, understanding of the risks of fracture from fluoridation will only be advanced materially by further case-control or cohort studies if they are not only designed to minimise the effects of bias and confounding, but also extremely large. Such an effort could only be justified if the upper bounds on risk derived from current evidence were deemed too high for comfort (or the lower bounds were judged to indicate a potentially important beneficial effect), and if a new study would have sufficient statistical power to achieve the required reduction in uncertainty.

Studies on bone disorders other than fracture could be feasible, particularly if the diseases are relatively common, such as Paget's disease.

5.1.6 Research recommendations

The main priority is for research to establish whether the bioavailability of fluoride differs when it is encountered in artificially fluoridated soft water as compared with hard water that is naturally high in fluoride. If important differences were demonstrated, there would then be a need for a case control study to investigate the relation of hip fractures to long-term consumption of artificially fluoridated water.

Studies of other bone diseases would be feasible, but in the absence of clear a priori toxicological concerns, are of lower priority.

5.2 Cancer

The possibility that fluoridation might increase the risk of developing cancer was raised by a series of reports of experiments in mice (Taylor, 1954; Taylor & Taylor, 1965) and by a report in 1975 purporting to show higher overall cancer mortality rates among the 10 largest US cities that practised water fluoridation than amongst the 10 largest US cities that did not (Burk & Yiamouyiannis, 1975). Neither the results of these early animal experiments nor the report of Burk and Yiamouyiannis have been accepted by subsequent expert reviews (eg IARC, 1982; Knox, 1985), but the important public health implications of the question have stimulated many further investigations.

The early studies looked at the possible association of fluoride with cancers of all types. Particular attention has been given to bone cancer, especially osteosarcoma, because ingested fluoride is concentrated in the bones. Some attention has also been given to cancers of the stomach, kidney and thyroid, because fluoride is usually absorbed in the stomach and can be concentrated in the kidneys and thyroid.

5.2.1 Current evidence

The York systematic review identified 26 studies that met the defined inclusion criteria, although two of these were not included in the main analysis (NHS CRD, 2000). Other reviews have evaluated studies using different criteria, and have generally included more studies in their evaluations. This overview is based on the material presented in the York review and other significant reviews (Knox, 1985; DHHS, 1991; Cook-Mozaffari, 1996; NHMRC, 1999).

i) Human data: ecological studies

The majority of data on the association of fluoridation with cancer rates come from ecological studies. Several studies have analysed data sets from ten fluoridated and ten non-fluoridated cities in the USA (Yiamouyiannis & Burk, 1977; NHMRC, 1999; NHS CRD, 2000). With the exception of the analysis by Yiamouyiannis & Burk, which did not adjust appropriately for sex, age and ethnic group, none of these analyses has suggested that overall cancer mortality rates were positively associated with fluoridation. Similar analyses in other areas in the US, and in the UK and elsewhere, have not shown any differences in total cancer rates between fluoridated and non-fluoridated populations, or between populations with water supplies naturally high or low in fluoride. Some ecological studies have looked specifically at bone cancer or at osteosarcoma, and have not observed any associations with water fluoridation (Hoover et al., 1991; Freni et al., 1992).

The largest ecological study was that of Hoover et al. (1991), which included 125,000 incident cancers and 2.3 million cancer deaths, with follow-up for up to 35 years of fluoridation. This study met the inclusion criteria of the York Review but was not included in the main analysis because it grouped non-fluoridated areas together with areas fluoridated within the most recent five years. In our opinion, this aspect of the analysis by Hoover et al. is appropriate, because it is very unlikely that cancer incidence or mortality would increase enough within five years of fluoridation to affect the results. We also consider that the results of this study are very important for the evaluation of the effects of fluoridation, because the large number of cancers studied produces high power to detect small effects. Hoover et al. singled

out osteosarcomas for detailed analysis and found no relationship with fluoridation. The only cancer site for which there was suggestive evidence of a relationship between incidence rates and duration of fluoridation was renal cancer, but in contrast the mortality data for renal cancer yielded some evidence for an inverse relationship with duration of fluoridation. Overall, Hoover et al. identified no trends in cancer incidence or mortality that could be ascribed to the consumption of fluoridated drinking water.

ii) Human data: analytical studies with data for individuals

There are few studies of this type. Three small case control studies of osteosarcoma have been reviewed by NHMRC (1999); two studies estimated individual exposure to fluoridated water from place of residence (McGuire et al., 1995; Moss et al., 1995), the third also included reported use of fluoride tablets and fluoridated toothpaste (Gelberg et al., 1995). None found an increase in cancer risk to be associated with increased exposure to fluoride. Further data are expected from an extension of the preliminary report of the McGuire et al. (1995) study (Lennon, personal communication).

5.2.2 Data from animal experiments

In 1987, IARC concluded that the few data available were insufficient to allow an evaluation of the carcinogenicity of fluoride to animals. Subsequently, however, concern was raised by the publication of the results from a study of lifetime administration of sodium fluoride to rodents (Bucher et al., 1991). The authors interpreted their results as equivocal evidence of carcinogenicity, based on the findings of 1 osteosarcoma in 50 male rats at a dose of 45 ppm and 3 osteosarcomas among 80 rats at a dose of 79 ppm; no associations between fluoride and osteosarcoma were observed among female rats or among mice.

5.2.3 Evaluation of existing data

Overall, the current evidence does not support the hypothesis that exposure to artificially fluoridated water causes an increase in the risk for cancer in humans. It is too early to see whether there might be an effect after very long exposure (see section 5.2.4 below), but the results available rule out more than a very small effect of artificial fluoridation on cancer risk for up to about 35 years of exposure. Furthermore, studies of cancer rates in relation to variations in naturally occurring fluoride levels provide information on lifetime exposure and the absence of any detectable adverse effects of fluoride in these studies provides a high level of reassurance concerning safety (Knox, 1985).

5.2.4 Risk estimate

The evidence available does not suggest that fluoridation of water increases the risk for cancer in general or for any particular type of cancer, including osteosarcoma. Neither the York Review nor other reviews have calculated a pooled estimate of effect, therefore it is difficult to estimate the maximum increase in risk which is compatible with the available data. For osteosarcoma, the three small case-control studies cannot exclude an increase in risk of the order of twofold for exposure to fluoridated water, but an increase as large as this is not compatible with the ecological data, in particular those analysed by Hoover et al. (1991). In conclusion, although a small increase in cancer risk cannot be excluded, the data do not suggest any increase in risk and in view of the type of data available it does not seem appropriate to estimate the number of cases of cancer that might be caused by fluoridation.

5.2.5 Exposure considerations

i) Duration of exposure

Artificial fluoridation was introduced to selected areas in the 1940s and 1950s. Most of the studies conducted so far have used data on cancers diagnosed up until the 1970s and 1980s. The majority of the information, therefore, relates to whether exposure to artificially fluoridated water for up to about 30 years may alter cancer rates, with some data for up to 35 years. There are examples of other agents that do not substantially increase cancer risk until about 25 years after first exposure, and most cancers occur in old age as a result of the accumulation of a lifetime of exposure to genotoxic and/or growth promoting agents. In view of this, there is a need to continue to monitor cancer rates in artificially fluoridated populations for at least 70 years after fluoridation was introduced. However, it should also be noted that studies of populations using water with naturally high fluoride levels, to which the people

would have been exposed throughout their life, have not given any indication of an increase in cancer risk.

ii) Accurate estimation of total exposure to fluoride

The majority of previous studies have used place of residence as an index of exposure to fluoridated water. However, total exposure to fluoride will depend on the volume of water consumed and on other sources of fluoride such as food, drink and toothpaste (see also Section 3). Assessment of all sources would in theory allow estimation of cancer risk in relation to total fluoride intake, and assessment of the component due to fluoridated water. In practice, however, it may be very difficult to obtain sufficiently accurate measures of intakes from all sources. The use of biomarkers such as toenails could be further investigated (see Feskanich et al., 1998 and Section 3).

5.2.6 Plausibility of effect

Very high levels of fluoride have long been known to be toxic, but the features and consequences characteristic of fluorosis in humans and other animals have not included the occurrence of cancer. Most agents that cause cancer directly do so because they are genotoxic, although some (non-genotoxic) agents can cause or promote cancer by other mechanisms, for example by stimulating cell division.

For fluoride, in vitro genotoxicity data are mostly for doses much higher than those to which humans are exposed. Even at these high doses, genotoxic effects are not always observed (NRC, 1993), and fluoride is consistently negative in the Ames test (DHHS, 1991). Some in vivo studies have shown that fluoride can in some circumstances induce mutations and chromosome aberrations in rodent and human cells. Overall, the evidence available has not established that fluoride is genotoxic in humans, and most of the studies suggest that it is not, but the possibility of some genotoxic effect cannot be excluded (DHHS, 1991; NRC, 1993).

Fluoride can have a mitogenic effect on osteoblasts (Bucher et al., 1991); this could provide a mechanism by which fluoride could increase the risk for osteosarcoma.

5.2.7 Gaps in the evidence

As noted above, there is no evidence yet on the possible effects of exposure to artificially fluoridated water for more than 40 years, and there are very few data relating individual exposure to fluoride from water and other sources with cancer risk.

5.2.8 Feasibility of research

Ecological analyses are feasible and should continue for the purpose of looking for possible effects of lifetime exposure to artificially fluoridated water.

More detailed information could be collected on a case-control basis, and might include estimates of total water consumption, other important dietary sources such as tea, and use of toothpaste, plus biomarkers such as toenails (Feskanich et al., 1998). Methodological studies would be needed to develop appropriate methods and to validate their accuracy.

Osteosarcoma is of interest but difficult to study because it is rare, and is not categorised separately in routine statistics. In England and Wales, there were 372 incident cases of bone cancer in 1994, and 204 deaths. Assuming that 34% of bone cancers are osteosarcomas (Hoover et al., 1991, cited in Cook-Mozaffari, 1996), this gives about 125 cases per year.

5.2.9 Research recommendations

1. An updated analysis of ecological data in the UK on fluoridation and cancer rates is required. It would be relatively straightforward to analyse recent cancer incidence and mortality data from ONS in relation to residence in fluoridated areas. Comparisons could be made between similar cities, and data on potentially confounding variables might also be incorporated. The long period since fluoridation

began would give a new analysis the possibility to detect any effect on cancer rates after long exposure.

2. The aetiology of osteosarcoma is poorly understood. If new case control studies of osteosarcoma are undertaken, exposure to fluoride should be included along with the other possible risk factors investigated.

5.3 Other health effects

Fluoride exposure has been postulated to cause a number of health effects other than those described above. Many of these, although plausible, have not been substantiated. The following paragraphs provide a brief summary of the most important of these possible effects, together with recommendations for further work (if any).

5.3.1 Immunological effects

Information regarding the allergic potential of fluoride in drinking water is sparse. A paper by Spittle (1993) concluded that some individuals exhibit an allergic/hypersensitivity reaction to fluoride, but reviews by NRC (1993), NHMRC (1991), and Chalacombe (1996) all concluded that the studies undertaken do not support claims that fluoride is allergenic. They considered the weight of evidence to show that fluoride is unlikely to produce hypersensitivity or other immunological effects. There is no information on the immunotoxicity of fluoride. Further work in this area would be useful, but in the absence of obvious toxic mechanisms for such an effect is considered to be of low priority.

5.3.2 Effects on reproduction

Adverse effects of fluoride intake on reproductive performance, such as reduced lactation, have been demonstrated in many species. However, these studies have used dietary concentrations very much higher than those in the fluoridated drinking water of humans (NRC, 1993).

Fluoride has also been implicated in a number of adverse outcomes relating to fertility and pregnancy, but there is insufficient evidence to establish a link between decreased fertility and fluoride exposure (NHMRC, 1999). The York Review found no evidence of reproductive toxicity in humans (NHS CRD, 2000).

A recent multigenerational study of sodium fluoride in rats, at fluoride levels in drinking water of up to 250ppm, found no impacts on reproduction, and mating fertility and survival indices were not affected (Collins et al., 2001). Parallel studies using the same exposure regimen revealed no evidence for effects on testis structure, spermatogenesis or endocrine function in male rats (Sprando et al., 1997, 1998), nor on numbers of corpora lutea, implants and viable fetuses in females (Collins et al., 2000).

The plausibility of fluoride affecting the reproductive capacity of humans at the intakes experienced from fluoridated drinking water is low.

5.3.3 Birth defects

Fluoride crosses the placenta and is incorporated in the tissues of the developing conceptus. Studies in areas of India and Africa that have high levels of naturally fluoridated water have not shown an increase in birth defects (DHSS, 1991). Erickson et al. (1976) found an association between drinking fluoridated water and congenital malformations in one set of data, but not in another. A study in Atlanta, Georgia, using the birth defects registry, found no association between birth defects and fluoridation of community water supplies (DHSS, 1991).

In 1957, an investigator linked an excess of Down's syndrome to fluoridation. However, later studies by other investigators provided strong evidence against this suggestion (DHSS, 1991; NHS CRD, 2000). The York Review (NHS CRD, 2000) reported six studies that examined whether there is an association between Down's syndrome and drinking water fluoride level[10]. All of the studies were of poor quality according to the review criteria. Four of the studies (Berry, 1958; Erickson et al., 1976; 1980; Needleman, 1974) showed no significant association. Two studies (Rapaport, 1957; 1963) found a significant ($p<0.05$)

positive association, ie increased Down's syndrome incidence with increased water fluoride level. However, it was noted that these two positive studies had methodological limitations; for example they did not control appropriately for the possible confounding effects of maternal age. Other confounding factors not controlled for in most of the studies were incidence of termination of pregnancy in which the child is diagnosed with Down's syndrome, and exposure of the mother to other sources of fluoride. Thus the evidence for an association between water fluoride level and the incidence of Down's syndrome is inconclusive, a conclusion reiterated by Whiting et al. (2001).

If fluoride reaches the developing fetus and is incorporated into its tissues, it could plausibly be teratogenic. The DHSS (1991) review concluded that experimental animal data do not provide any additional evidence for an association between fluoride in drinking water and birth defects; the other major reviews (NHMRC 1991, 1999; NRC, 1993) provide no comment on this issue. A recent multigeneration developmental toxicity study on rats given up to 250ppm fluoride in drinking water (Collins et al., 2000) showed no effects on fetal morphological development, although ossification of the hyoid bone in F2 fetuses was significantly reduced at the 250ppm top dose level.

Human and experimental animal data suggest that drinking even high levels of fluoride in water does not cause birth defects, though there may be adverse consequences for bone ossification at very high exposure levels. Further work on this aspect is not considered to be of high priority.

5.3.4 Renal effects

The kidney is a potential site of acute fluoride toxicity because of its exposure to relatively high fluoride concentrations (NRC, 1993). It has been established from human studies that the kidney removes fluoride from the blood more efficiently than it removes other halides. In addition, renal clearance of fluoride decreases in individuals with renal insufficiency or diabetes mellitus. However, several large community-based epidemiological studies found no increased renal disease associated with long term exposure to drinking water with fluoride concentrations of up to 8mg/l (DHSS, 1991; NRC, 1993).

It is plausible that the kidney could be a target for fluoride toxicity, and there is limited evidence for kidney effects in experimental toxicity studies in animals. Further investigation is therefore warranted to determine the level of toxicity, if any, following low level intakes in humans. However, in view of the negative results in the epidemiological studies mentioned above, this is not considered to be of high priority.

5.3.5 Gastrointestinal tract

With the exception of monofluorophosphate, high concentrations of fluoride releasing compounds form hydrogen fluoride on mixing with hydrochloric acid in the stomach. Hydrogen fluoride can be irritating to the gastric mucosa, resulting in dose-dependent adverse effects. The data for human effects at low exposure are limited, but the indication is that gastrointestinal effects are not a problem at optimal drinking water fluoride concentrations (DHSS, 1991; NRC, 1993).

A study by Susheela et al. (1993) assessed the prevalence and severity of gastrointestinal disturbances (and other non-skeletal manifestations) in an area of endemic skeletal and dental fluorosis in India. The highest prevalence (52.4%) of non-ulcer dyspeptic symptoms was found among 288 individuals (69 families) living in a village where the (natural) mean fluoride concentration in the 36 separate water sources was 3.2ppm (range 0.25 to 8.0ppm). Eleven of these water sources were defined by the authors as 'safe' (ie with fluoride levels of 1.0ppm or less). The authors noted that in patients who reverted to 'safe' water, dyspeptic symptoms and complaints disappeared within 2-3 weeks. Other research by Susheela et al., (1992) revealed that the long term ingestion of fluoride by ten patients on sodium fluoride therapy (30mg per day) for otosclerosis was associated with non-ulcer dyspeptic symptoms in eight of the patients (Susheela et al., 1992).

10 The York team has subsequently published a paper specifically on Down Syndrome and water fluoride levels (Whiting et al., 2001)

The effects of fluoride on the gastric mucosa have been described in detail by Whitford (1996). Gastric irritation, by release of hydrogen fluoride in the stomach at high doses of fluoride intake, is plausible. However, it is unlikely that sufficient hydrogen fluoride will be released from the low concentrations of fluoride in drinking water in the UK to cause irritation in healthy individuals. It is possible that individuals who have an existing stomach disorder may be susceptible to irritation following ingestion of fluoridated water, but there is no published evidence for this. This issue is considered to be of low priority for further research.

5.3.6 Intelligence

Two Chinese studies have found a positive association between high levels of fluoride in drinking water and reduced children's intelligence/IQ. Confounding factors were dismissed, but their possible influence on the results of the study was not adequately explained by the authors. At lower fluoride concentrations (eg 0.91 ppm), which are more comparable to the levels in fluoridated water in the UK, a reduction in children's IQ was not observed (Lu et al., 2000; Zhao et al., 1996). There is a possible link here with lead toxicity and the impact of fluoride on lead bioavailability (see below).

Further investigation of this aspect is considered to be of low priority.

5.3.7 Thyroid (goitre)

The York Review listed three studies in which goitre was the outcome of interest. Two of these studies (Gedalia & Brand, 1963; Jooste et al., 1999) found no significant association with water fluoride level. The third (Lin et al., 1991) found a significant positive association between combined high fluoride/low iodine levels and goitre. However, because this study looked at combined fluoride/iodine uptakes, and has not been published in a peer reviewed journal, the findings should be treated cautiously. Further work on this aspect is of low priority.

5.3.8 Miscellaneous effects

Several other health outcomes have been postulated as being connected with elevated fluoride intake:

- Effects on the pineal gland
- Senile dementia
- Age at menarche
- Anaemia during pregnancy
- Sudden Infant Death syndrome
- Primary degenerative dementia

Available information on these outcomes is limited and inconclusive. Further targeted research may be warranted, but this is presently of low priority unless and until critical literature reviews are undertaken that demonstrate specific research needs.

5.3.9 Indirect effects of adding fluoride to water

In addition to any direct impact on health resulting from increased uptake of fluoride by the body, it is possible that fluoridation of water supplies could influence health through other mechanisms. In particular it is necessary to give consideration to the possibility of:

- toxicity from other substances added to water as part of the fluoridation process;
- an effect of higher fluoride in water on dietary exposure to toxic metals (eg through leaching of copper from pipework and dissolution of aluminium from cooking pans); or
- an effect of fluoride in drinking water on the uptake/bioavailability or toxicity of metals in the gut.

The importance of these theoretical hazards will depend on the inherent toxicity of the substances concerned and the impact, if any, of fluoridation on the dose of the toxins.

In addition, it is possible for the presence of other substances in water and food to affect the absorption of fluoride (see also Exposure section) and therefore reduce the effectiveness of an intended caries-preventive dose.

5.3.10 Substances added during the fluoridation process

The UK's Water (Fluoridation) Act 1985 allows hexafluorosilicic acid (H2SiF6) and disodium hexafluorosilicate (Na2SiF6) to be used to increase the fluoride content of water. The published Code of Practice on Technical Aspects of Fluoridation of Water Supplies (DOE, 1987) gives specifications for these substances and states that 'the product… must not contain any mineral or organic substances capable of impairing the health of those drinking water correctly treated with the product'. For H2SiF6, limits are given for a number of possible impurities, including for iron, heavy metals, sulphate, phosphate, and chloride. The specification for Na2SiF6 powder requires a minimum of 98% m/m of the pure chemical, and gives maximum limits for impurities, including heavy metals (as lead) and iron. No other substances are allowed to be used in the fluoridation process, other than an anti-caking agent (the identity of which must be disclosed) in the case of Na2SiF6. Synthetic detergents are not permitted.

Thus there is no likelihood, in normal operation, for any fluoridation plants to introduce other compounds into the drinking water supply (other than approved anti-caking agents and any impurities present in the fluoridation chemicals).

It has been suggested that arsenic is introduced into drinking water through the fluoridation process because this element is present as an impurity in fluoride compounds. However, because of the dilution factor, the contribution of arsenic from this source would be extremely small, and in any case there is a standard for the total arsenic level in drinking water.

5.3.11 Dietary exposure to metals

Enhanced leaching of metals from water pipes and cooking utensils can occur if the fluoridation process significantly alters the pH of the water. This can happen in abnormal (accidental) circumstances. For example, incidents in Westby, Wisconsin and New Haven, Connecticut USA, resulting in peak fluoride levels of 150ppm and 51ppm respectively, reduced the pH value of the water and caused copper to be leached from plumbing[11].

Studies on the leaching of aluminium from cooking utensils at standard fluoride concentrations in the region of 1ppm have indicated a small (5%) increase in leaching compared to non-fluoridated water (Moody et al, 1990). These studies indicate that aluminium leaching resulting from water fluoridation is not a significant cause for concern.

5.3.12 Effects on bioavailability or toxicity of toxic metals

Aluminium

Aluminium and fluoride are mutually antagonistic in competing for absorption in the gut. Therefore the more fluoride in the diet, the less aluminium is absorbed. At the same time, ingestion of aluminium counteracts dental fluorosis, reducing fluoride stores in teeth and bones. This effect has been demonstrated in experimental animals and humans (Foster, 1993; quoting Navia 1970). Thus fluoride will reduce rather than increase any toxic potential from aluminium in food or water.

Aluminium has been implicated as having an etiological role in Alzheimer's disease. It follows that if absorption of aluminium is reduced by ingestion of fluoride, this condition should be less common in communities with fluoridated drinking water (Foster, 1993; Kraus & Forbes, 1992). A study conducted in South Carolina (Still & Kelly, 1980) did indeed find a significantly lower rate of admission of Alzheimer's disease patients to mental hospitals from the county with the highest level of fluoride in the drinking water than from the two counties in the same state with the lowest levels, though it had significant methodological shortcomings. A later study by Forbes (1997) found an increased incidence of Alzheimer's disease with higher water fluoride levels. In considering this information it must be cautioned that the possible link between aluminium uptake and Alzheimer's disease is by no means established.

11 See http://www.fluoridealert.org/accidents.htm

An experimental study (Varner et al., 1998) found that chronic administration of aluminium fluoride or sodium fluoride in the drinking water of rats resulted in distinct morphological alterations in the brain, including effects on neurones and the cerebrovasculature. The authors concluded that further studies of aluminium fluoride and sodium fluoride are needed to establish the relative importance of a variety of potential mechanisms contributing to the observed effects as well as to determine the potential involvement of these agents in neurogenerative diseases.

Lead

It is generally considered that lead passes across the intestinal mucosa by both passive and active transport. It appears that lead is actively transported by mucosal protein carriers that mediate calcium transport and that calcium can displace lead, although the interactions between lead and calcium metabolism are complex and not well understood. Experimental evidence suggests that dietary calcium deficiency is associated with an increase in the body burden of lead and the susceptibility to lead toxicity during chronic lead ingestion, and that stimulation of the parathyroid and vitamin D endocrine system is associated with an increase in lead and calcium absorption when significant quantities of lead are not consumed (IEH, 1998). The first of these findings implies that if fluoride reduces calcium uptake, then an increase in lead absorption could result. This is plausible because of the strong affinity between calcium and fluoride, but probably occurs only at high calcium concentrations.

Two recent studies (Masters & Coplan, 1999; Masters et al., 2000) have found an association between ingestion of drinking water treated with silicofluorides and elevated blood lead in children. The authors' conclude that silicofluoride agents maintain lead in suspension and/or enhance lead uptake from the gastrointestinal tract, and postulate that fluoridated drinking water indirectly increases lead toxicity, including fetal and early childhood developmental deficits, and IQ learning deficits. They also make a link between the use of silicofluorides in water treatment systems and increased violent crime. However, according to the US EPA there is no substantive evidence to suggest that fluoridation of drinking water with any fluoridating chemical increases the concentration or bioavailability of lead in drinking water via chemical reactions in the plant, the distribution system, the home plumbing system, or the human body itself (Urbansky & Schock, 2000). This appears to be a controversial area and further studies are awaited.

5.3.13 Conclusions

Further research on the possible effects of fluoride on immunological function, reproduction, birth defects, intelligence, the kidney, gastrointestinal tract and thyroid, and other suggested impacts, is considered to be of low priority.

Substances added to drinking water during the fluoridation process (including impurities of the added substances) are unlikely to add any significant toxic potential to the water.

Fluoride in water at normal levels can increase slightly the amount of leaching of aluminium from cooking utensils. High concentrations of fluoride can also result in leaching of copper from pipework. These effects are considered to be of minimal health significance in normal circumstances.

Fluoride appears to reduce the bioavailability of dietary aluminium. The situation with regard to lead is somewhat less clear-cut and may be influenced by calcium status.

Complexities associated with speciation, ionic interactions etc, yield uncertainties in a number of aspects. It is recommended that this area be kept under review.

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6. Conclusions and principal research recommendations

6.1 Conclusions

This report has considered the scope for further research that could help to inform risk management decisions on water fluoridation. Our starting point was the knowledge base that is already established. Much of this was recently reviewed in the report prepared by the York NHS CRD, and we have not attempted to duplicate their work. We have, however, taken account of additional information (eg, on pharmacology and toxicology) that did not fall within the scope of the York Review. Also, in some areas, our interpretation of the strengths and weaknesses of the existing evidence base differs from that of the York group, and we have indicated where this is so. With this background we have attempted to identify researchable uncertainties and gaps in current scientific understanding that could bear importantly on decisions about fluoridation. In doing this we have taken account of the practicality of further studies that might be carried out.

One of the key issues pertaining to water fluoridation is that of exposure. Because of the use of topical health care products (eg toothpaste) containing fluoride and the potential for exposure from a number of other sources, it is especially important to understand better the total exposure that individuals are experiencing. It is also necessary to gain a better understanding of the bioavailability and absorption of fluoride from naturally fluoridated and artificially fluoridated water.

The main health outcomes of interest and relevance (apart from the intended beneficial effects on dental caries) are dental fluorosis, bone health and cancer. With regard to bone health, the possible impact of fluoridation on risk of hip fracture is the most important in public health terms. We have identified a number of important knowledge gaps relating to these health endpoints; our priority recommendations for research to fill these gaps are listed below. Additional health outcomes suggested by some to be associated with fluoride ingestion include immunological effects, reproductive and developmental toxicity, and effects on the kidney and gastrointestinal tract. Other concerns are related to the chemicals that are added during the fluoridation process, and to indirect effects such as increased leaching of lead from pipes and aluminium from cooking utensils and altered bioavailability or toxicity of these substances. The evidence for any significant health effects associated with these factors is, however, considered to be weak and no specific research studies are recommended here.

There is almost universal agreement that tooth decay in children is related to social class. The majority of the research conducted to date indicates that water fluoridation reduces dental caries inequalities between high and low social class groups. Further studies are recommended that look at appropriate measures of social inequalities related to water fluoridation, dental caries and fluorosis and possible confounding factors.

6.2 Research recommendations

The following recommendations outline a programme of research that would substantially increase our understanding of the impacts of water fluoridation on health and facilitate decision making on public health policy in this area.

Total exposure and uptake

1. New studies are needed to investigate the bioavailability and absorption of fluoride from naturally fluoridated and artificially fluoridated drinking water, looking also at the influence of water hardness. This is particularly important because if the bioavailability is the same, many of the findings relating to natural fluoride can also be related to artificial fluoridation (see recommendations 2, 4 & 13).

2. Further attempts should be made to estimate lifetime intakes of fluoride using both urinary excretion (as an exposure marker) and dietary ingestion data, and to determine the relative contribution of fluoride in artificially fluoridated water to total fluoride uptake. If the bioavailability of fluoride from artificially and naturally fluoridated water (see 1 above) is the same, then studies of fluoride accumulation in people who have lived in naturally high fluoride areas could be informative.

3. Continuing information is needed on trends in fluoride exposure resulting from changes in the use of discretionary fluorides (eg use of toothpaste use by infants).

4. If the bioavailability of fluoride from artificially fluoridated water is found to be substantially greater than from naturally fluoridated water (see 1 above), then new studies should address the aggregate rate of accumulation of fluoride in target tissues from artificial fluoridation and assess whether this is fast enough to produce a risk of pathological change within a reasonable life span in more than a small (and defined) minority of those exposed.

5. Within the National Diet and Nutrition Survey, 24-hour urine samples are being collected for fluoride analysis. It is recommended that:

- Periodic 24 hour urinary fluoride sampling should remain a feature of at least some national diet surveys, to monitor trends and particularly to look at fluoride intake across the population.
- Fluoride ingestion (from all sources) and fluoride excretion - and therefore fluoride retention - should be measured in children.
- The relative importance of water as a source of fluoride ingestion in children should be determined.

Dental caries

6. Studies are needed to provide an estimate of the effects of water fluoridation on children aged 3-15 years against a background of widespread use of fluoride toothpaste, and to extend knowledge about the effect of water fluoridation by social class (or other relevant measures of socioeconomic status), taking into account potentially important effect modifiers such as sugar consumption and toothpaste usage.

7. Further information is required on the impact of water fluoridation on recurrent caries in adults and root caries in older adults.

8. There is a need to extend understanding of the impact of fluoridation on quality of life and economic indices in addition to the more customary outcome measures based on the prevalence of decayed, missing and filled teeth.

Dental fluorosis

9. Cross-sectional studies are required to determine the current prevalence of dental fluorosis in fluoridated and non-fluoridated communities, taking careful account of potential confounding factors and effect modifiers (see also recommendations 6 and 7 above).

10. Further studies are needed to determine the public's perception of dental fluorosis, with particular attention on the distinction between acceptable and aesthetically unacceptable fluorosis.

11. Any prospective epidemiological studies of fluoridation and dental caries should incorporate dental fluorosis as one of the outcome measures.

Social class

12. Further studies are needed to address appropriate measures of social inequalities in relation to water fluoridation, dental caries, dental fluorosis and the role of confounding factors such as tooth brushing with fluoride toothpaste, other fluoride therapeutic agents, non-water dietary fluoride ingestion and dietary sugar ingestion (see also recommendations 6 and 9 above).

Bone health

13. If research demonstrates important differences in the bioavailability of fluoride according to the nature of water fluoridation and water hardness (see recommendation 1 above), a case control study should be carried out to investigate the relation of hip fractures to long-term consumption of artificially fluoridated water.

Cancer

14. An updated analysis of UK ecological data on water fluoridation and cancer rates is required.

Annex - Fluoride intake and excretion in children

<table>
<tr><th>Author, year</th><th>Study population</th><th>Study design</th><th>Results</th></tr>
<tr><td>Ekstrand et al, 1994</td><td>4 normal term infants, 2 male, 2 female, USA</td><td>A cross over design used to study each infant from 1 to 4 times with the 3 regimes. For 11 days before the study and for the 24 hours of the study all infants consumed the same diet. Under 140 days of age infants only consumed formula and after that were allowed certain products. The formula and all products were of known fluoride concentration.

3 regimens; A no fluoride supplementation, B 0.25mg fluoride each day given with a feed (immediately before the second feed of the day, C 0.25mg fluoride 3 hours after the first feed of the day. In B and C parents also gave the fluoride supplement for the 11 days before the fluoride balance but not on the day before the balance study.

Urine and faeces was collected for a 72 hour period which started at the time of admission for A and on administration of the fluoride for B and C.</td><td>31 balance studies were carried out, 11 on Regime A, 8 on B and 12 on C. Age range from 65 to 422 days on first day of study.

Mean and SDs in µg/kg/day

Intake / Urine Excrete / Faeces excrete / Absorb% / Retain%
A 20.5 (4.5) / 15.5 (1.9) / 2.0 (0.7) / 90.1 (3.2) / 12.5 (13.8)
B 46.0 (5.2) / 19.2 (2.7) / 4.9 (4.5) / 88.9 (10.5) / 47.1 (14.7)
C 48.9 (8.1) / 21.2 (3.2) / 2.0 (1.0) / 96.0 (1.8) / 52.3 (6.7)

Fluoride from Supplement (mean and SD)

Intake (mg) / Retention (%)
B 234 (12) / 68.1 (14.8)
C 250 (1) / 73.0 (6.0)

The authors found no evidence to support the idea that the timing of the supplementation influenced the amount absorbed.</td></tr>
<tr><td>Kimura et al, 2001</td><td>29 children aged 1 to 6 years, 14 boys, 15 girls, water F <0.05ppm, Japan, no fluoride regime

Samples collected from:

August 29
November 26
February 28
March 27</td><td>24 hour duplicate diet collection for a three day period repeated four times in each of August, November, February and March; parts of food not normally eaten eg bones, skins removed

Results are reported as amount of fluoride consumed per day (F mg/day) and as F mg/kg/day. The range of values, mean and standard deviation are given for each age group and the total sample.</td><td>F mg/day / F mg/kg/day
Age / n / Range / Mean ± SD / Range / Mean ± SD
1 / 6 / 0.04-1.24 / 0.23 ± 0.023 / 0.004-0.115 / 0.023 ± 0.023
2 / 5 / 0.10-0.51 / 0.26 ± 0.12 / 0.009-0.049 / 0.021 ± 0.014
3 / 6 / 0.11-0.70 / 0.25 ± 0.14 / 0.008-0.052 / 0.019 ± 0.011
4 / 5 / 0.13-0.66 / 0.26 ± 0.13 / 0.008-0.039 / 0.015 ± 0.007
5,6 / 7 / 0.09-0.72 / 0.37 ± 0.21 / 0.005-0.043 / 0.018 ± 0.011
Total / 29 / 0.04-1.24 / 0.28 ± 0.18 / 0.004-0.115 / 0.019 ± 0.014

No seasonal variation, authors conclude that there was a higher level of intake than among Americans living in a non-fluoridated area, lower than Americans living in fluoridated area. The daily energy intake was 78% of that recommended by Ministry of Health. Evidence to suggest that the diets were not unrepresentative of the population.</td></tr>
</table>

Author, year	Study population	Study design	Results
Chowdhury et al, 1990	Children aged 11 to 13 months, 65 consented and 60 completed the study. 31 in a fluoridated and 29 in a non-fluoridated area, New Zealand.	Duplicate portion technique was used for a three day period, leftovers and parts not normally consumed were removed. It was noted how children were fed and the use of toothpaste and supplements. Results are presented for each individual and for fluoridated and non-fluoridated areas in mg F/day and mg F/kg bw (body weight). They are presented for food and drink only and all sources of fluoride.	Fluoridated n=31 Non-fluoridated n=29 **Mean SD Range Mean SD Range** **Food and drinks** mgF/day 0.263 0.131 0.089-0.549 0.082 0.054 0.038-0.314 mgF/kg bw 0.028 0.013 0.009-0.056 0.009 0.006 0.004-0.038 **From all sources** mgF/day 0.305 0.232 0.093-1.299 0.195 0.174 0.039-0.720 mgF/kg bw 0.033 0.026 0.009-0.150 0.020 0.017 0.004-0.061 The authors concluded that the current levels of fluoride intake of the infants studied from food and drink alone are not in excess of recommended optimal levels of intake. They noted that the use of toothpaste and supplements could push some infants above the recommended levels.
Guha-Chowdhury et al, 1996	74 children met the inclusion criteria. Children were selected according to their caries status and fluoridation status. 66 children aged 3 to 4 years, were available for all three examinations. There were thus four cells in the whole study but in this paper the high caries (ds>3) and caries free children (checked by radiograph at baseline) were combined and their fluoride intake presented by area of residence.	24 hour duplicate diets collected on three separate days at intervals of 6 months. Leftovers, skins and bones etc were removed from the analysis and the parents brought the duplicate plate to the clinic. The amount of toothpaste used and swallowed was determined, using a detailed method that involved measuring the fluoride that was spat out and the fluoride that was left on the brush.	**Fluoridated n=34 Non-fluoridated n=32** **Range Mean ± SD 95%CI Range Mean ± SD 95% CI** **Diet alone** mgF/day 0.05-0.31 0.15± 0.06 0.13-0.17 0.09-0.74 0.36± 0.17 0.30-0.42 mgF/kg bw 0.004-0.02 0.008 ± 0.003 0.006-0.010 0.004-0.04 0.019± 0.009 0.015-0.023 **Diet and toothpaste** mgF/day 0.17-1.21 0.49±0.25 0.41-0.57 0.26-1.31 0.68±0.27 0.59-0.77 mgF/kg bw 0.01-0.06 0.027±0.012 0.023-0.031 0.01-0.07 0.036±0.015 0.030-0.042 The authors concluded that the current levels of fluoride intake of the infants studied from food and drink alone are not in excess of recommended optimal levels of intake. They noted that the use of toothpaste and supplements could push some infants in low fluoridated areas above the recommended levels.

Author, year	Study population	Study design	Results
Ekstrand et al 1984	5 breast fed and 5 bottle fed infants aged 8 to 28 weeks, all living in an area with 1ppm F in the drinking water	All children's fluoride intake and excretion was measured for a 24 hour period. The babies were weighed to calculate how much they had consumed. All urine and faeces were collected.	Breast fed babies Intake Range 5 - 8 mg, urinary output was mean of 30.4mg ± 12.4 (range 15.6mg to 49.7mg) and 1.3mg ± 1.0 in faeces (range 0.1mg to 2.7mg). Bottle fed babies intake range 891 - 1012 mg, urinary output was mean of 359.7mg ± 45.9 (range 265.1mg to 427.1mg) and 22.9mg ± 21.5 in faeces (range 4.8mg to 48.9mg) All the breast fed babies were in negative balance compared with a retention rate of 52 to 61% in the bottle fed group. Data are presented for all as individuals.
Brunetti and Newbrun, 1983 abstract only	10 children, (4 boys, 6 girls) aged 3 to 4 years, USA, in fluoridated area 1 ppm	8 Children studied for 4 consecutive days, 1 for 3 consecutive days and 1 twice for 2 consecutive days over a five day period. Duplicate diet collected as were all urine and faeces. Diffusion method of Waterhouse et al (different to other studies).	Average daily intake was 0.33 ± 0.14 mg / day and the excretion was 0.28 ± 0.08 mg / day. The average fluoride daily balance was 0.05 ± 0.08 mg / day. The authors concluded that fluoride retention was minimal.
Villa et al, 2000	20 boys aged 3 to 5 years, six or seven of each year of age, living in an orphanage, water fluoride level of 0.5-0.6 ppm and an altitude of 500-700m above sea level. Chile	Assessment made on two consecutive 24 hour periods of intake and excretion of fluoride. Height and weight measures, toothpaste use and swallowing was assessed for each individual. All children ate the same food and it was checked that there were no leftovers. Water consumption was recorded. Duplicate samples were taken. Data presented for individuals	**Fluoride intake** **Mean** **S.D.** **Range** **95% CI** Total mgF 1.019 0.105 0.846-1.176 0.973-1.065 mg F/kg/day 0.064 0.015 0.042-0.093 0.057-0.071 **Fluoride excretion** **Mean** **SD** **Range** **95% CI** mg/day 0.358 0.076 0.251-0.55 0.325-0.391 % of intake 35.5% 8.4% 24.4-62.6% 31.7-39.3% This paper contains a detailed discussion of several factors such as urinary pH.

Author, year	Study population	Study design	Results
Zohouri and Rugg-Gunn, 2000	Children aged 4, with water fluoride level of 0.30-0.36 ppm, 78 of 116 children completed all aspects of the survey. Iran.	3 day food diaries were collected by interview and food substances checked for fluoride concentration. Ingestion of fluoride from toothbrushing was estimated for each child. 24 hour urine was collected and analysed from each child. The measurements were made once in summer and once in winter for each child. Excretion in faeces was not measured.	Mean figures with SD Fluoride from diet 0.390 ± 0.122 mg /day; 0.028 ± mg/kg/day Fluoride from all sources 0.426 ± 0.126 mg/day; Mean urinary excretion 0.339 ± 0.1 mg/day The difference was +0.087 ± 0.143 mg equivalent to 80% excretion Fluoride ingestion was higher in summer and higher in rural areas. The authors concluded that this was a much higher level of excretion that had been reported previously for children in this age group. They hypothesised that it might in part be due to urinary pH as a result of the children's vegetarian diet.

Medical Research Council
20 Park Crescent
London
W1B 1AL

Telephone: 020 7636 5422
Facsimile: 020 7436 6179
Website: www.mrc.ac.uk

357 Millard St,
Orillia, On.
L3V 4H5
August 16/11

Councilors: Don Jenkins & Patrick Kehoe
cc: His Worship Mayor Orsi
& councilors

Subject: Fluoridation Of City Water

Dear Sirs:

I am writing in regards to the June 23/11 Simcoe.com article"MOH wants fluoride in water"written by Frank Matys. http://www.simcoe.com/news/article/1032603--moh-wants-fluoride-in-water

I am a resident of Orillia, born and raised here, and I have definite concerns about fluoridation of our water! Is it ethical to add unauthorized drugs to drinking water without individual consent? In my job, it is important when administering medications, that we have the right person, the right dosage, and the right time. We drink only a small portion of water used, but we wash fruit etc, cook, mix juices, shower and bathe in it. (Our skin is our largest organ) Lake Simcoe is already taxed by pollution and Simcoe runs into Couchiching and Couch is our water source. Think of our marine and wildlife.
For those people unaware of the origin of this chemical, let me explain. Fluoride in water is a bi-product of the Phosphate Fertilizer Plants. If these bi-product gases escape from the smoke stacks, its air pollution, if it gets into the rivers its water pollution. Yet if these gases are trapped in water, its put into tankers and delivered to municipalities and told "its good for you"???????
Fluoride has been banned in many European countries, and discouraged in many more like Japan and China.
Because fluoride forms complexes with many metal ions like lead and aluminum which are very toxic. Fluoride is a cumulative poison, 50% of what is ingested is passed through the kidneys, however the balance accumulates in various bones and tissue such as pineal, thyroid, adrenals, pancreas, & pituitary glands, and brain. Because of these complexes, fluoride also inhibits numerous metals like calcium and magnesium which are needed in the body.
There have been over 30 animal studies done, which prove brain damage, and lower IQ as well as many other health issues such as Hypothyroidism.
In earnest I ask you to research the statistics on this chemical at some of the following sites, including the one related to Waterloo, Ontario, as well as doing a search of your own.

www.fluoridealert.org and www.waterloowatch.com . An excellent video is http://www.youtube.com/watch?v=88pfVo3bZLY (28 min).
An excellent 5 min one is PROFESSIONAL PERSPECTIVES: An Environmental Professional Speaks Out on Fluoridation (5.44 min).
http://www.youtube.com/watch?v=AvExFr5J9BI

Sincerely,

FOR OUR SAKE, OUR CHILDRENS, & GRANDCHILDREN VOTE NO!!!!!!!!!!!!!!!!

Dianne Orton

Dianne Orton
326-6329

hospital ORILLIA
SOLDIERS' MEMORIAL

Orillia Soldiers' Memorial Hospital
170 Colborne Street West, Orillia, ON L3V 2Z3
T (705) 325-2201 • www.osmh.on.ca

September 9, 2011

Dr. Charles Gardner
Medical Officer of Health
Simcoe-Muskoka District Health Unit
15 Sperling Drive
Barrie ON L4M 6K9

Dear Dr. Gardner

The Medical Advisory Committee (MAC) met on September 6, 2011 and reviewed your recommendation relating to fluoridation of the Orillia water supply. I'm pleased to provide the following motion of support. The MAC has recommended that the Board of Directors for Orillia Soldiers' Memorial Hospital also support this initiative. The Board meets on September 27, 2011 and will discuss this recommendation at that time.

Moved by Dr. Kim McIntosh
Seconded by Dr. Tony Reid

THAT following a review of *The Case for Fluoridation in Orillia* by Dr. Charles Gardner, Medical Officer of Health, Simcoe Muskoka District Health Unit, the Medical Advisory Committee supports water fluoridation in Orillia and recommends to the Board of Directors that Orillia Soldiers' Memorial Hospital support the recommendation of the Simcoe Muskoka District Health Unit to add fluoride to the City of Orillia water supply with ongoing monitoring of levels.

CARRIED

I wish you all the best in moving forward on this valuable public health initiative.

Yours sincerely

Don Atkinson, MD, MMM, CPE
Chief of Staff/VP Medical Affairs

/jms

From: Jackie Shaughnessy [mailto:JMShaughnessy@osmh.on.ca]
Sent: Wednesday, September 14, 2011 1:09 PM
To: PublicWorks Internet Email
Cc: Gardner, Charles; Nicky Marchant
Subject: Support for Fluoridation of Water Supply in Orillia

TO: Peter Dance, Public Works Commissioner
City of Orillia

FROM: Dr. Don Atkinson, Chief of Staff/VP Medical Affairs
Orillia Soldiers' Memorial Hospital

I'm pleased to enclose a motion from the Medical Advisory Committee (MAC) at Orillia Soldiers' Memorial Hospital (OSMH) supporting fluoridation of the water supply in Orillia. The MAC is comprised of the physician leaders at the hospital. The MAC has recommended that the OSMH Board support this valuable public health initiative. The Board is meeting on September 27th and will discuss MAC's recommendation at that time. Please contact me at (705) 325-2201 ext 3480 if you have any questions.

from the desk of ....
Jackie Shaughnessy
Medical Affairs Coordinator
Orillia Soldiers' Memorial Hospital
170 Colborne Street W, Orillia ON L3V 2Z3
(705) 325-2201 ext 3480
(705) 327-9169 (fax)

JASON COVEY

From: Peter Dance
Sent: Sunday, October 16, 2011 3:17 PM
To: JASON COVEY
Cc: Percival Thomas
Subject: FW: Ltr. from Dianne Orton re fluoridation of City water

I am not sure if you have seen this or not.
Peter

-----Original Message-----
From: Janet Nyhof
Sent: Wednesday, August 17, 2011 10:47 AM
To: Peter Dance
Subject: RE: Ltr. from Dianne Orton re fluoridation of City water

Also, Ms. Orton left a note stating:
"Would like to be notified when there is a public meeting and when it goes back to Council - 705-326-6329."

-----Original Message-----
From: Peter Dance
Sent: Wednesday, August 17, 2011 10:42 AM
To: Janet Nyhof
Subject: RE: Ltr. from Dianne Orton re fluoridation of City water

I would recommend consent and refer to PW as part of the consultation process. We will be reporting to Council in September on the process that will be followed.
Peter

-----Original Message-----
From: Janet Nyhof
Sent: Wednesday, August 17, 2011 10:32 AM
To: Peter Dance
Subject: Ltr. from Dianne Orton re fluoridation of City water

The attached letter was received in our office today.
Would you recommend that this letter be placed on the Sept. 19th Consent Agenda for Council's info or should this be a direct response from yourself? Other suggestion?

Please advise.
Janet

City of Orillia

ORILLIA CITY CENTRE
50 ANDREW ST. S., SUITE 300
ORILLIA, ON.
L3V 7T5

TELEPHONE
(705) 325-3975

publicworks@orillia.ca

ENGINEERING DEPARTMENT

November 3, 2011

Ms. Dianne Orton
357 Millard Street
Orillia, ON L3V 4H5

Dear Ms. Orton:

Re: Fluoridation of City Water

You have requested to be notified about public meetings regarding fluoridation of the City of Orillia's water supply. The City is conducting a public consultation process with the assistance of the Simcoe Muskoka District Health Unit, to consider fluoridation. The schedule for the public consultation process will be as follows:

- February 29, 2012 First Public Forum – Information gathering
- May 29, 2012 Second Public Forum – Reporting back
- June 2012 Present recommendation report to Council

Both public forums will take place at the Council Chambers in the Orillia City Centre building. Further information will be available on the City's website shortly, and notices will be issued for each of the public meetings.

Regards,

Jason Covey

Jason R. Covey, P. Eng.
Water & Wastewater Engineer
Public Works - Engineering Division

From: Carole Clinch [mailto:caclinch@gmail.com]
Sent: Tuesday, December 13, 2011 4:07 PM
To: JASON COVEY
Subject: Section 19 SDWA

Jason R. Covey, P. Eng.
Water & Wastewater Engineer
Public Works - Engineering Division
City of Orillia
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
705-325-2227
jcovey@orillia.ca

Dear Mr. Jason Covey, P Eng

As discussed on the phone, I have attached a summary of concerns regarding the fluorosilicate products used in artificial water fluoridation. This was sent to the MOE, Integrity Commissioner of Canada, Environmental Commissioners of Canada and Ontario, Auditor General of Canada, and others.

I have attached a short, simple ppt RE Health Canada in .pdf format.

I have attached a 1-page summary of recent lawsuits launched in 2011. I am contact with these lawyers.

The fluoride products used in artificial water fluoridation (fluorosilicates) are defined as "toxic substances" recommended for "virtual elimination" by various environmental laws and treaties designed to protect public safety. See relevant quotes:
http://www.newmediaexplorer.org/chris/Clinch_2009_Time_Line.pdf

The fluoride products used in artificial water fluoridation (fluorosilicates) are defined as "hazardous waste" according to a wide range of international, federal and provincial laws designed to protect public safety. See discussion and relevant quotes:
http://www.newmediaexplorer.org/chris/Clinch_2011_Fluorosilicates_are_Hazardous_Waste.pdf

1. Natural calcium fluoride is found in nature and is not considered a toxic compound because of its comparatively high lethal oral acute dose in rodents where 50% of the animals die, as demonstrated in the Merck Index, 7th Edition (LD50 = 3,750mg/kg). Sodium fluoride has a comparatively low acute lethal oral doses in experimental animals, which is comparable to arsenic and lead[1] (LD50=125mg/kg). Fluoridation products such as sodium fluoride are considered lethal from between 1 to 5mg/Kg body weight.[2],[3] which is in contrast to calcium fluoride found naturally in water, considered lethal at about 5,000mg/Kg BW.[4]

2. Natural calcium fluoride does not have the same corrosive ability with metals in neutral or acidic waters, as do the man-made fluorides used in artificial water fluoridation.

3. Natural calcium fluoride also does not require neutralization with pH adjustment chemicals such as sodium hydroxide prior to injection into water, which now is a common practice for water districts. These pH adjustment chemicals add considerably to the costs of artificial water fluoridation, sometimes exceeding the costs for the fluoride products.[5]

The toxicity or a product depends not just on the quantity of the substance ingested. It also depends on many other factors such as:

1. the timing of ingestion, (Faroes Statement 2007);
2. particular vulnerability of the individual ingesting the toxin;
3. Interactions of the toxin (synergism) with other species in either drinking water or in the human body

The scientific/legal determination of safety is based on 2 types of research:

1. Animal studies (toxicology studies)
2. Human studies (randomized, controlled clinical trials are the gold standard)

The actual fluoride products used in artificial water fluoridation (silicofluorides Na2SiF6, H2SiF6) have neither the required animal studies nor the required human studies to demonstrate safety. Until 2010 there were NO TOXICOLOGY STUDIES available which examined the long-term use of these products. There are now available two (2) recently published toxicological studies [1],[2] demonstrating health harm from the long-term use of these products.

The actual fluoride products used in artificial water fluoridation (silicofluorides Na2SiF6, H2SiF6) are used as a "medical treatment to prevent disease" according to Health Canada, for a "special health purpose," according to the Supreme Court of Canada, yet it has never been regulated or approved by Health Canada.
http://www.newmediaexplorer.org/chris/Clinch_2009_Fluoride_is_Unregulated_Unapproved_Illegal_Drug_Health_Product.pdf

All other fluoride products used for dental care are regulated under the Food and Drugs Act.

- "Health Canada **does not regulate** hexafluorosilic acid or sodium silicofluoride products, the actual products used in water fluoridation, which are allegedly **used as a medical treatment to prevent dental disease**." *Petition #299, Answer #3, to Auditor General of Canada*

In the absence of any studies demonstrating safety, but the availability of 2 recent toxicology studies showing health harm, any claims that these products are "safe" are **not based on well-established scientific protocols designed to protect public safety**.

In the absence of any studies demonstrating safety, any claims that these products are "safe" are **not based on legal definitions and requirements designed to protect public safety.**

Section 19 of the SDWA will come into force on Jan 1, 2013**.** It is attached with commentary.

1. Hexafluorosilicic acid is used as a (tooth) medicine yet it is **not regulated** by any government agency.
2. Hexafluorosilicic has **no studies demonstrating safety**, but 2 studies demonstrating harm from long-term use.
3. Putting a product used as a (tooth) medication into drinking water is problematic because a) you cannot control the dose, b) cannot give citizens CHOICE to refuse, c) you cannot obtain INFORMED CONSENT and d) you pollute the environment.

Let me know how I can help disseminate this information to council, water operators and citizens of Orillia. I believe that they deserve to know.

The law review executive summary below gives a brief bio of me.

Sheldon Thomas <sheldon.thomas@clearwaterlegacy.com> is knowledgeable on this subject.
http://www.clearwaterlegacy.com/ABOUTUS.html
http://www.clearwaterlegacy.com/TESTIMONIALS.html

Peter Van Caulart is also knowledgeable.

Peter Van Caulart, Director
Environmental Training Institute
Ridgeville (Niagara) ON
Website: www.etivc.org

Phone: 905 892-1177

Email: <pvancaulart@cogeco.ca>

Sincerely,

Carole Clinch B.A., B.P.H.E.
Bill Clinch B.Sc., P Eng.

Professional Engineer has both professional and legal obligations as described in the Professional Engineers Act R.R.O. 1990, Reg. 941 (sections 72, 77) amended to O. Reg. 13/03, where the “duty to public welfare” is paramount, and where they are directed to “not express publicly...opinions on professional engineering matters that are not founded on adequate knowledge” and, where there is a **“**failure to make responsible provision for complying with applicable statues, regulations, standards, codes, by-laws and rules in connection with work being undertaken by or under the responsibility of the practitioner.”

Carole Clinch BA BPHE
307 Normandy Ave
Waterloo, Ontario, Canada N2K 1X6
519-884-8184

Author of 20+ reviews submitted to various government agencies.
Author of 4 published papers on fluoride toxicity.
Author of complaint filed with Canadian Food Inspection Agency (CFIA). CFIA ruled that health claims by manufacturer of bottled fluoride water (Nursery Water) were NOT LEGAL. Are the health claims made for municipal drinking water legal?

Petition #221, 243, 244, 245, 299 to the Auditor General of Canada
http://www.oag-bvg.gc.ca/internet/English/pet_lp_e_938.html

Clinch CA, Parent G, Morin P 2011 Executive Summary-Law Review submitted to Auditor General of Canada
http://www.newmediaexplorer.org/chris/Canada_Request_for_Audit_2011_Executive_Summary.pdf

Clinch CA. Fluoride Interactions with Iodine and Iodide: Implications for Breast Health.

Fluoride April-June 2009:42(2):75-87.
http://www.fluorideresearch.org/422/files/FJ2009_v42_n2_p00i-iii.pdf

Long H, Jin Y, Lin M, Sun Y, Zhang L, Clinch C. Fluoride Toxicity in the Male Reproductive System. Fluoride Oct-Dec 2009;42(4):275-291.
http://www.fluorideresearch.org/424/424/files/FJ2009_v42_n4_p260-276.pdf

Clinch CA. Does Dental Fluoride Use have Clinically Significant Effects on Oral Bacteria? Fluoride Oct-Dec 2010;43(4):213-22.
http://www.fluorideresearch.org/434/files/FJ2010_v43_n4_p205-214.pdf

Clinch CA. Excess Fluoride Interference with Cystic Fibrosis Transmembrane Conductance Regulator (CFTR). Fluoride Jan-Mar 2011;44(1):7-8.
http://www.fluorideresearch.org/441/files/FJ2011_v44_n1_p007-008_pq.pdf

Court Cases Initiated in 2011

1. Foli v. Metropolitan Water District

currently pending in the Federal District Court for the Southern District of California as Case No. 11CV1765 JLS (BLM).
http://fluoride-class-action.com/wp-content/uploads/Foli-v-metropolitan-water-district-of-southern-california-11CV1765-JLS-5373546-0-9893.pdf

Blumenthal Nordrehaug & Bhowmik Files Brief Seeking to Stop Metropolitan Water District from Fluoridating Drinking Water with a Drug (HFSA) Not Approved by the FDA, Nov 28, 2011
http://www.prweb.com/releases/prwebWaterFlourideLawsuit/California/prweb8996182.htm

- "this action is brought to seek redress for the unlawful and unconstitutional medication of Plaintiffs by Defendant Metropolitan Water District of Southern California using an unapproved drug."
- managing partner of the law firm for the plaintiffs, Norm Blumenthal, stated: "The action of the Metropolitan Water District of adding a drug (HFSA) to our drinking water for medical purposes without first obtaining FDA approval of this drug for such purposes is illegal and needs to be stopped."

2. Clallam County Citizens for Safe Drinking Water, and Eloise Kailin v. City of Port Angeles and City of Forks

- "fluoridation regulations requiring ANSI/NSF Standard 60 fluoride are unconstitutional (U.S. Const. Art. VI, cl. 2) because they require what is not lawful under federal law"

3. Nemphos v. Nestle-Gerber

Case 1:11-cv-02423-CCB, Document 1, Filed 08/29/2011
http://www.nidellaw.com/blog/?m=201109

- The science thus shows that when fluoride is ingested by people under the age of eight, there is a significant risk of harm, while at the same time there is no benefit. The defendants in this case knew that their products contained fluoride and actively marketed these products to children and to parents for the use in their children. The defendants' failure to warn of the risk of harm from these products is unacceptable.

4. Oshlack v. Rous Water, 2011

currently pending in the Land and Environment Court, New South Wales, Australia
http://www.ukcaf.org/files/biscoe_decision_may_2011.pdf

A decision handed down by the Honourable Justice P. M. Biscoe on April 28, 2011 notes that where environmental laws conflict with public health policy, legislation permitting the policy of artificial water fluoridation (e.g., Fluoridation Act) cannot be considered in isolation ("unfettered"), as previously understood. The full impact of artificial water fluoridation on human health and the environment must also be considered.

Currently, environmental laws, regulations and treaties conflict with legislation enabling fluoridation.
http://www.newmediaexplorer.org/chris/Clinch_2009_Time_Line.pdf
http://www.newmediaexplorer.org/chris/Clinch_2011_Fluorosilicates_are_Hazardous_Waste.pdf

2011 HEALTH CANADA REVIEW & NATIONAL HEALTH MEASURES SURVEY

demonstrate that the Health Canada Guidelines are not protective of health

by Carole Clinch BA, BPHE

Author of 4 published reviews on fluoride

Co-Author of 2011 law review on Canadian legislation

Author of 20 reviews submitted to various government agencies

HEALTH CANADA REVIEW states

Health Canada Guidelines are only “protective of health, provided care is taken to follow Health Canada’s recommendations regarding other sources of exposure to fluoride.”

IN OTHER WORDS...

Health Canada guidelines are **conditional** on **careful monitoring** of total fluoride exposure.

Is Health Canada carefully monitoring "other sources of exposure to fluoride"?

Petition #445 to the Auditor General of Canada, Question 11:

http://www.oag-bvg.gc.ca/internet/English/pet_lp_e_938.html

"Which government agency is responsible for disclosing all sources of, and quantifying, potential and historically based exposures to fluoride?"

Health Canada Response:

"There is no federal agency responsible for such data."

Can parents or clinicians monitor fluoride exposure from all sources?

"it is doubtful that parents or clinicians could adequately track children's fluoride intake"

Warren JJ, Levy SM, Broffitt B, Cavanaugh JE, Kanellis MJ, Weber-Gasparoni K. Considerations on Optimal Fluoride Intake Using Dental Fluorosis and Dental Caries Outcomes: A Longitudinal Study. J Public Health Dent 2009 ; 69(2):111-5.

Has Health Canada ignored the repeated recommendation by the WHO to assess total fluoride exposure?

YES!

"Dental and Public Health should be aware of the total fluoride exposure in the population before introducing any additional fluoride programmes for caries prevention."

World Health Organization. 1994 Fluorides and oral health. Series 846.

Did the Health Canada Review discuss fluorosilicates – the actual products used in artificial water fluoridation?

Health Canada discusses natural fluorides – not man-made fluorosilicates.

Did Health Canada Review explain that fluoride in drinking water is the single largest source of fluoride therefore the single largest cause of fluorosis disease?

"**The major dietary source of fluoride for most people in the United States is fluoridated municipal (community) drinking water**, including water consumed directly, food and beverages prepared at home or in restaurants from municipal drinking water, and commercial beverages and processed foods originating from fluoridated municipalities." p24 2006 National Research Council Review of Fluorides in Drinking Water

Was the Health Canada Review written by unbiased individuals who declared conflicts of interest?

All 6 panel members are known to be active promoters of artificial water fluoridation.

Did the Health Canada Review hire individuals with demonstrated expertise in fluoride in a variety of health fields?

The panel of 6 consisted of 4 dentists.

The other 2 individuals had published no papers on fluoride to demonstrate expertise.

Canada's expert on fluoride – Dr. Hardy Limeback – was not invited to participate even though he co-authored the National Research Council 2006 Review on Fluorides

Was the Health Canada Review a systematic review or meta-analysis?

NRC Committee member Dr. Thiessen explains:

Health Canada's “approach is exactly backwards for an organization whose responsibility is presumably to protect the health of its nation's population.”

1. Adverse health effects do not exist unless high quality studies demonstrating such effects exist.
2. Benefits for concentrations of fluorides in drinking water do exist until high quality studies demonstrate otherwise.

Did Health Canada give an accurate characterization of the National Research Council's work?

According to 2 members of the NRC Committee, including the chair.

Did Health Canada review all of the research available to them?

Health Canada was provided with 150 studies (25 human studies + 125 animal studies) demonstrating neurotoxic harm from fluoride in drinking water.

Health Canada only mentioned 5 human studies and 11 animal studies showing neurotoxicity. The other 125 studies were not mentioned nor were they listed in the bibliography even though they had been submitted to Health Canada for their consideration.

Did Health Canada assume that as long as no one looks for side effects of the fluoride product swallowed as medication, there will be none?

If you don't look for adverse health effects...

you don't find adverse health effects.

Is the credibility of the Chief Dental Officer for Canada being questioned?

Complaints have been filed with the Integrity Commissioner and investigations are ongoing.

Chief Dental Officer is receiving salaries from both Health Canada and Provincial government agencies.

* Is “double-dipping” permissible?

Does the 2011 National Health Measures Survey by Health Canada demonstrate that there is an epidemic of dental fluorosis?

YES!

Only 60% of children have “normal” teeth.

2011 National Health Measures Survey included...

10 non-fluoridated communities

* St.Maurice QUE
* Montreal centre QUE
* Montreal south, QUE
* Quebec City QUE
* Clarington ON
* Cobourg ON
* Kitchener ON
* St Catharines ON
* Quesnel/Williams Lake BC
* Vancouver BC

5 fluoridated communities

* Toronto east ON
* North York ON
* Edmonton AB
* Moncton NB
* Red Deer AB

Is the **incidence** and **severity** of dental fluorosis much higher in fluoridated communities?

YES!

Therefore, Health Canada's survey of mostly unfluoridated communities does not represent either the frequency or severity of dental fluorosis in fluoridated communities.

Artificial water fluoridation significantly increases both the frequency and severity of DF

1999 Ontario Ministry of Health & Long Term Care Review

20 to 75% of citizens have dental fluorosis in fluoridated communities.

12 to 45% of citizens have dental fluorosis in unfluoridated communities.

Clark DC, Shulman JD, Maupome G, Levy SM. 2006 Changes in Dental Fluorosis Following Cessation of Water Fluoridation. Community of Dental and Oral Epidemiology 34(3):197-204.

"When fluoride was removed from the water supply in 1992, the **prevalence and severity** of TFI [Thylstrup-Fejerskov Index quantifies DF] scores decreased significantly".

CONCLUSION

2011 HEALTH CANADA REVIEW

&

2011 NATIONAL HEALTH MEASURES SURVEY

clearly demonstrate

Health Canada Guidelines are

NOT PROTECTIVE OF HEALTH!

Section 19, Ontario SDWA, c32

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_02s32_e.htm#BK16

> SDWA Section 19. (1) Each of the persons listed in subsection (2) shall,
> (a) exercise the level of **care, diligence and skill in respect of a municipal drinking-water system that a reasonably prudent person would be expected to exercise** in a similar situation; and
> (b) act honestly, competently and with integrity, with a view to **ensuring the protection and safety of the users of the municipal drinking water system**. 2002, c. 32, s. 19 (1).
> **Same**
> (2) The following are the persons listed for the purposes of subsection (1):
> 1. The **owner of the municipal drinking water system**.
> 2. If the municipal drinking-water system is owned by a corporation other than a municipality, **every officer and director of the corporation.**
> 3. If the system is owned by a municipality, **every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system**. 2002, c. 32, s. 19 (2).
> **Offence**
> (3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).
> **Same**
> (4) A person may be convicted of an offence under this section in respect of a municipal drinking-water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4).

Ontario Municipal Drinking Water licensing program bulletin Jan 2011 available from: http://www.portal.gov.on.ca/drinkingwater/dw_el_prd_043923.pdf

- p2 Standard of Care: "The standard of care for municipal drinking water systems (Section 19 of the SDWA) will come into force on **January 1, 2013.**
- "you should inform yourself and be diligent in your oversight responsibilities. Part of this diligence may include **engaging persons who have the particular expertise in the various aspects of owning and operating drinking water systems**."

Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils
http://guelph.ca/uploads/ET_Group/waterworks/Water%20Quality/Appendix%20A%20-%20Taking%20Care%20of%20Your%20Drinking%20Water_A%20Guide%20for%20Members%20of%20Municipal%20Councils.pdf

- p6 "Section 11 of the SDWA describes the legal responsibilities of owners and operating authorities of regulated drinking water systems."
- p6 "Owners and operators are responsible for ensuring their drinking water systems:
  - provide water that **meets all prescribed drinking water quality standards**
  - operate **in accordance with the Act and its regulations**,"
- P7 "It is important that **members of municipal council and municipal officials** with decision-making authority over the drinking water system understand that they **are personally liable,** even if the drinking water system is operated by a corporate entity other than the municipality."

Dr. David Wiebe
Public Heath Dental Consultant
135 The Queensway, Barrie, Ontario L4M 0B4

Tel: 705-252-5009 Fax: 705-252-1710
E-Mail: davidwiebe@rogers.co

December 19, 2011

Mayor Angelo Orsi
City of Orillia
50 Andrew Street, Suite 300
Orillia, ON L3V 7T5

Dear Mayor Orsi:

RE: Community Water Fluoridation

I am a specialist in public health dentistry and currently provide ongoing consulting services for several Ontario public health units. Also, I am a member of Georgian College's Dental Programs Advisory Committee and a clinical instructor in the dental hygiene program at George Brown College in Toronto. My background includes twenty-three years of private practice in the Niagara area and being an investigator in the Community Dental Health Services Research Unit at the Faculty of Dentistry, University of Toronto.

The purpose of this letter is to recommend that the City of Orillia implement community water fluoridation. The use of fluoride in drinking water has been recognized as one of the greatest public health achievements of the 20th century by the U.S. Centres for Disease Control.

An article titled "Fluoridation Works: Let Your Voice Be Heard" appeared in the July/ August 2009 issue of the *Journal of the Canadian Dental Association.* It states: while public opinion on fluoridation may have varied over the years, the results of systematic reviews of scientific evidence have remained constant, showing water fluoridation to be a safe and effective means of preventing dental decay. If attitudes and decisions of fluoridation were strictly based on science, there would no longer by any debate.

Despite of overwhelming evidence in 18 major reviews of water fluoridation since 1997, including an expert panel convened by Health Canada in 2007, a small group of individuals opposed to fluoridation continue to ask local governments to not implement

or stop community water fluoridation, often claiming health risks that simply are not supported in the scientific literature.

Although other fluoridation products are available, water fluoridation remains the most equitable and cost-effective method of delivering fluoride to a community, regardless of age, education or income, and by a method that is not dependent on an individual's behaviour. As the Chief Dental Officer of Canada, Dr. Peter Cooney says, with dental disease as the number one chronic disease among children and adolescents in North America, fluoridation is an important public health measure.

As the Mayor of Orillia, I am sure that you are well aware of the impact of poor oral health on children, adults and seniors in your community, especially upon low-income groups and new immigrants. This is why the Simcoe County District Health Unit and more than 90 national and international professional health organizations have endorsed water fluoridation to help prevent tooth decay.

In closing, I would ask that you seriously consider supporting the implementation of water fluoridation in your community. To help you with this, I have included the following documents.

1. alPHa News Release: Public Health Supports Fluoridation, dated February 17, 2011.
2. Ministry of Health Promotion and Sport News Release: Drinking Water Fluoridation, Statement from Dr. Arlene King, Chief Medical Officer of Health, dated April 4, 2011.

Sincerely,

David P. Wiebe

David P. Wiebe, BSc, BA, DDS, DDPH, DGrt, CMM III
Public Health Dental Consultant

c. Simcoe County District Health Unit

alPHa
Association of Local
PUBLIC HEALTH
Agencies

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Toronto ON M5B 1J3
Tel: (416) 595-0006
Fax: (416) 595-0030
E-mail: mail@alphaweb.org

Providing leadership in public health management

NEWS RELEASE

February 17, 2011 **For Immediate Release**

Public Health Supports Fluoridation

TORONTO -- The use of fluoride in drinking water is a safe, effective, and economical way to help prevent dental cavities with no scientifically proven adverse health impacts, according to Ontario public health agencies who voted overwhelmingly in support of the fluoridation of community drinking water at an Association of Local Public Health Agencies (alPHa) conference in Toronto last week. When added to water at levels recommended in Ontario and across the country, studies have determined that fluoride is not harmful and the health benefits extend to all residents in a community regardless of age, education or socio-economic status. The fluoridation of drinking water has been used in Canada for over 40 years and between 1979 and 2009 the incidence of dental cavities for children, adolescents and adults has dropped significantly; from 2.5% to 0.5% for children, from 9.2% to 2.5% for adolescents, and from 17.5% to 10.7% for adults.

According to estimates from the Center for Disease Control and Prevention, it costs about 50 cents per person to fluoridate community water and every $1 invested yields $38 in avoided costs for dental treatment. While many communities in Ontario continue the practice of fluoridating drinking water for the benefit of all their citizens, a small number of municipalities have made the decision to stop fluoridation in the past few years. "The argument that fluoridation is no longer required because dental health has improved over the past decades is flawed. Dental health has improved in large part because of the addition of fluoride. Removing fluoride now doesn't make sense," says Valerie Sterling, alPHa President and member of the Toronto Board of Health.

In addition to fluoridation, alPHa is calling on the provincial government to provide support, including provincial legislation and funding to municipalities for the fluoridation of community drinking water. "We want to avoid what happened with tobacco legislation. We had a patchwork of local by-laws until the provincial government implemented the Smoke-Free Ontario legislation. A similar situation exists today with fluoridation resulting in some communities losing the benefit to their dental health," explains Sterling.

In a separate meeting on the same day, the Medical Officers of Health that manage the public health agencies across Ontario voted in support of community drinking water fluoridation. Dr. Paul Roumeliotis, Chair of the Council of Ontario Medical Officers of Health, a section of alPHa, sees fluoridation as a basic essential to good health.

"As Medical Officers of Health, we see daily the impacts that poor oral health can have on children, on seniors, and on adults. We are also well aware of the disproportionate impacts of poor dental health upon low income populations and often among those newly arrived in Canada from countries with poor dental services and poor water infrastructure."

More than 90 national and international professional health organizations have endorsed the use of fluoride at recommended levels to prevent tooth decay, including the World Health Organization, Health Canada, the Canadian Pediatric Society, the Canadian Dental Association, the Canadian Medical Association and the Ontario Medical Association. alPHa is proud to join their number.

- 30 -

For more information regarding this news release, please contact:

Linda Stewart
Executive Director
(416) 595-0006 ext. 22

Fact Sheet

November, 2010

Fluoride & Drinking Water

Fluoride is a mineral that occurs naturally in the environment. Fluoride is found in soil, air and water.

At appropriate levels, Fluoride in drinking water has been proven to significantly reduce cavities and dental decay. This finding is strongly supported by an extensive body of Canadian and international research, and has been commonly accepted in the scientific community for almost 70 years.

Scientific guidance on optimal fluoridation levels is routinely reviewed by expert panels convened by Health Canada and conveyed to all provinces and territories.

The most recent Health Canada review, undertaken in 2007, assessed the latest available evidence on the benefits and potential risks. This review concluded that there is no harmful health risk from the fluoridation of community drinking water at current levels and that fluoridation continues to be an effective public health strategy to prevent dental disease.

The City of Toronto's policies and practices in drinking water fluoridation are guided by these expert reviews and recommendations. Toronto Public Health and Toronto Water are committed to ensuring the safety of the Toronto drinking water supply, and protecting the health of Toronto residents.

The dental benefits and safety of fluoridation of drinking water are strongly supported by many health organizations, including the Ontario Medical Association, the Canadian Dental Association, the Ontario Dental Association, the American Dental Association, the Public Health Dentists Association, the Chief Dentist of Canada and the International Association for Dental Research.

Fluoride has been added to the Toronto drinking water supply since 1963. Studies of Toronto children 12 years after the introduction of water fluoridation and again in 2000 show that by 2000, there was a 77.4% mean reduction in decayed, missing and filled baby teeth for five year-old children. There was also a 390% increase in the percentage of children with no tooth decay when compared to rates reported prior to the addition of fluoride in 1963.

This dramatic improvement in dental health is due to a combination of water fluoridation, other sources of fluoride (such as toothpaste), better nutrition and better dental preventive care. Water fluoridation plays an important role in a comprehensive approach to good dental health.

The current target level of fluoride in Toronto drinking water is 0.6 parts per million - a level which is less than the naturally occurring fluoride levels from a number of European and North American water sources, including parts of Ontario.

Fluoride levels in Toronto's drinking water are regulated in Ontario under the Safe Drinking Water Act administered by the Ministry of the Environment.

Fact Sheet

Fluoride & Drinking Water

Toronto Public Health will continue to monitor expert reviews and recommendations on water fluoridation from provincial, federal and international health research organizations to ensure Toronto residents continue to have appropriate levels of fluoride in drinking water.

For more information:

World Health Organization, (WHO)

Health Canada

Chief Medical Officer of Health (Ontario) (CMOH)

Ontario Medical Association

The U.S. Centers for Disease Control and Prevention (CDC)

Ontario Dental Association

Canadian Dental Association

alPHa

Association of Local PUBLIC HEALTH Agencies

WHAT IS PUBLIC HEALTH?

If you have ever had a vaccination, eaten in a restaurant, gone swimming in a public pool, had a home visit from a nurse for advice on breastfeeding or seen a TV ad about the dangers of smoking, you have been served by the public health system.

Public Health is the part of the publicly-funded health system in Ontario that supports overall healthy populations by monitoring community health status, promoting healthy behaviours, identifying, minimizing and eliminating health hazards, investigating and managing disease outbreaks, enforcing health protection laws, and responding to health-related emergencies. It is the ounce of prevention that is worth a pound of cure.

The 36 public health agencies or units across Ontario are each governed by a Board of Health. Each agency is responsible for providing programs and services that support the overall health of the people in one of 36 public health regions.

WHO IS alPHa?

The Association of Local Public Health Agencies (alPHa) is the non-profit organization that provides leadership to boards of health and public health units in Ontario. Our members are the 36 health units across Ontario. alPHa works closely with the senior leadership in our member health units. This includes board of health trustees, medical and associate medical officers of health, and senior public health managers in each of the public health disciplines – nursing, inspections, nutrition, dentistry, health promotion, epidemiology and business administration.

alPHa represents the interests of the 36 public health units in Ontario and lends expertise to members on the governance, administration and management of health units. The Association also collaborates with governments and other health organizations, advocating for healthy public policy and a strong, effective and efficient public health system in the province.

WHAT WE DO

We represent not only the diversity of public health disciplines of our members, but also the diversity of public health needs in Ontario's communities, through effective communication and collaboration among members as well as with policy makers and other associations. In this, we seek to establish a unified and powerful voice for public health in Ontario that is consulted and respected, and to provide assistance to our members for the efficient and effective delivery of public health services to their communities.

Through policy analysis, discussion, collaboration, and advocacy, alPHa members and staff act to promote public health policies that form a strong foundation for the improvement of health promotion and protection, disease prevention and surveillance services in all of Ontario's communities.

CONTACT

Linda Stewart, Executive Director,
416-595-0006 ext. 22

News Release Communiqué

DRINKING WATER FLUORIDATION
STATEMENT FROM DR. ARLENE KING, CHIEF MEDICAL OFFICER OF HEALTH

NEWS April 4, 2011

As Chief Medical Officer of Health for Ontario, I am very concerned about the loss of fluoridated drinking water in certain communities in spite of consistent evidence that water fluoridation is safe and effective.

Support for Water Fluoridation

More than 90 national and international professional health organizations, including Health Canada, the Canadian Public Health Association, the Public Health Agency of Canada, the Canadian Dental Association, the Canadian Medical Association, the U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization, have endorsed the use of fluoride at recommended levels to prevent tooth decay.

In fact, the use of fluoride in drinking water has been called one of the greatest public health achievements of the 20th century by the CDC.

Benefits of Water Fluoridation

Combats Tooth Decay

The benefits of water fluoridation are well documented. According to expert research, fluoridated drinking water reduces the number of cavities in children's teeth, which contributes to their healthy development. Reductions of tooth decay have also been observed in adults and seniors who reside in communities with fluoridated water. Even with other sources of fluoride available today, the American Dental Association estimates that water fluoridation continues to be effective in reducing tooth decay by 20-40 per cent.

Conversely, removing fluoride from drinking water systems has the potential to contribute to increased rates of tooth decay. The findings of several studies, including from the CDC, suggest that tooth decay generally increases in a population after water fluoridation is discontinued. In addition, a 2007 report on water fluoridation by the Institut National de Santé Publique du Quebec reveals that the percentage of kindergarten children at high risk of developing tooth decay in Dorval, Quebec doubled in the two year period after water fluoridation was halted in 2003.

Reduces Dental Care Expenditures and Inequalities in Health

Water fluoridation also has the capacity to help reduce dental care expenditures. The Ontario Dental Association has stated that the cost of waiting until tooth decay has manifested is significantly higher than the cost of preventing it in the first place. The CDC estimates $38 in avoided costs for dental treatment for every $1 invested in community water fluoridation. With the fluoridation of drinking water playing an important role in the overall promotion of good oral health and prevention of dental decay, I am concerned that removing it from drinking water may put a strain on, and impact the success of, important provincial programs such as the Children in Need of Treatment Program and Healthy Smiles Ontario - both developed to benefit those least able to afford dental services.

And indeed, removing fluoride from drinking water will place those least able to afford or access dental treatment at an increased risk for oral health problems. The health benefits of drinking water fluoridation extend to all residents in a community, regardless of age, socioeconomic status, education or employment.

Safety of Fluoridated Drinking Water

Fluoride in drinking water is also safe. In Ontario, fluoride additives are required to meet rigorous standards of quality and purity before they can be used. When they are added to water at levels recommended in Ontario and across the country, studies have not linked fluoride to cancer, bone fractures or intelligence levels. Studies have also found that water fluoridation is safe for the environment, and poses no risk to plants and animals.

In addition, most dental fluorosis, a condition that occurs when a child receives too much fluoride during tooth development, is mild and appears as white stains on the teeth. In this mildest form, fluorosis may affect the look of a tooth, but will not affect its function. While moderate or severe fluorosis does occur, the Canadian Health Measures Survey: Oral Health Statistics 2007-2009 concludes that, "[so] few Canadian children have moderate or severe fluorosis that, even combined, the prevalence is too low to permit reporting. This finding provides validation that dental fluorosis remains an issue of low concern in this country."

Good Oral Health Means Good Overall Health

The importance of maintaining good oral health should not be taken lightly - it is an important part of being healthy overall. As tooth decay is the single most common chronic disease among Canadians of all ages and poor oral health is linked to diabetes, heart disease and respiratory conditions, water fluoridation is, and must be recognized as, a very important public health measure.

An estimated 70 per cent of Ontarians currently have access to water that is fluoridated, and I would urge all Ontarians to continue to support the fluoridation of their municipal drinking water systems so that everyone can enjoy the lasting health benefits.

Media Contact:
Julie Rosenberg, Ministry of Health Promotion and Sport, 416-326-4833

ontario.ca/health-promotion-news

Disponible en français

City of Orillia

ORILLIA CITY CENTRE
50 ANDREW ST. S., SUITE 300
ORILLIA, ON.
L3V 7T5

TELEPHONE
(705) 325-3975

publicworks@orillia.ca

ENGINEERING DEPARTMENT

January 3, 2012

Ms. Dianne Orton
357 Millard Street
Orillia, ON L3V 4H5

Dear Ms. Orton:

Re: City of Orillia Public Forum on Fluoridation

Thank you for your interest in the City of Orillia's public consultation process regarding fluoridation of city drinking water. The public works department has received a copy of your August 16, 2011 letter to the City, and your comments and concerns will be addressed as part of the City's public consultation process. The City will be hosting a public forum along with the Simcoe Muskoka District Health Unit, on February 29th, 2012, and details are enclosed for your reference. Further information about the City's public consultation on fluoridation can be found on our website at: http://www.orillia.ca/en/livinginorillia/haveyoursay.asp.

Regards,

Jason Covey

Jason R. Covey, P. Eng.
Water & Wastewater Engineer
Public Works - Engineering Division

Enclosure

JASON COVEY

From: JASON COVEY
Sent: Tuesday, January 03, 2012 8:56 AM
To: 'caclinch@gmail.com'
Subject: City of Orillia Public Forum on Fluoridation
Attachments: FluoridationPublicForumNotice_15Dec2011.pdf

Carole,

Please see attached the details of the City of Orillia's upcoming Public Forum on Fluoridation of City Drinking Water. Further information about the City's public consultation process can be found on our website at: http://www.orillia.ca/en/livinginorillia/haveyoursay.asp. Should you have any questions or wish to register as a presenter, please do not hesitate to contact me.

Jason R. Covey, P. Eng.
Water & Wastewater Engineer
Public Works - Engineering Division
City of Orillia
50 Andrew St. S., Suite 300
Orillia, ON L3V 7T5
705-325-2227
705-329-2670 (fax)
jcovey@orillia.ca

From: Tony Bridgens
Sent: Tuesday, January 03, 2012 2:05 PM
To: JASON COVEY
Subject: Fluoride, about time we got it.

Jason Covey, P.Eng.
My Name address etc are as below; I wish to register so as to submit a written presentation to the public forum in favour of the fluoridation of drinking water in Orillia. I will not be in the City from now till April, so please advise what to do: thanks!

Information about what fluoride salt is proposed, dosage method, and how the fluoride ion interacts with Ca++ in the water of the hardness of Orillia's would be helpful. I used to mine fluorspar.

Btw I was chair of the Simcoe County Chapter of P. E. O. many years ago.. ..have demitted from the organisation since.
p.s. My wife and I are always happy to have intelligent guests at our B&B.

Best regards

Tony Bridgens

From: ruth.bednar@sympatico.ca [mailto:ruth.bednar@sympatico.ca]
Sent: Wednesday, January 04, 2012 2:25 AM
To: JASON COVEY
Cc: Carole Clinch
Subject: RE: City of Orillia Public Forum on Fluoridation

Hello Jason,

Thank you for informing me of the upcoming Forum in Orillia on February 29th, 2012.

I will be away until the beginning of April, and if there are further public forums after my return, I hope to attend. However, I hope the information and independent scientific studies that has been provided by all the health experts will be addressed to the public so a well informed decision will be made.

Sincerely,

Ruth Bednar
RNCP ROHP

From: Kelly Clune [mailto:wastereductionservices@yahoo.com]
Sent: Thursday, January 05, 2012 1:27 PM
To: MAYOR EMAIL; Patrick Kehoe; Michael Fogarty; LindaMurray; Don Jenkins; Pete Bowen; Andrew Hill; Paul Spears
Subject: Flouride - WHY?

Information about the dangers of flouride have been available for many years. Orillia already has enough chemicals in our drinking water. Why add more?

"***The main beneficiaries from fluoride use are the big industries that find a profitable outlet for their otherwise embarrassing toxic byproducts. It is time for change.***"
From the following article:http://www.fluoridation.com/calgaryh.htm

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From: Sheldon Thomas [mailto:sheldon.thomas@clearwaterlegacy.com]
Sent: Tuesday, January 10, 2012 3:30 PM
To: JASON COVEY
Subject: Registration request

Good afternoon, Mr. Covey.

I would like to register for the City of Orillia's Public Forum on water fluoridation, February 29, 2012.

I am a retired Manager of Water Distribution for the City of Hamilton, now a trainer of provincial water system operators.

I would like to examine fluoridated water as a 'product', delivered by the vendor City of Orillia, and present a business case to measure the likely success or failure of the product. This is an approach to the subject that should be of particular interest to city councillors.

My address is : 3494 Rexway Drive, Burlington, Ontario L7N 2L6
Phone number : below
Email : shelthomas@cogeco.ca

Thank you for your consideration of this request.

Sheldon Thomas
Clear Water Legacy
www.clearwaterlegacy.com
(905) 333-9203

From: James Reeves [mailto:james.reeves@lusfiber.net]
Sent: Monday, January 16, 2012 8:26 AM
To: JASON COVEY
Subject: Fluoridation is a Waste of Tax Money
Importance: High

To: Jason Covey, P.E.
From: James W. Reeves, Ph.D., P.E.

I know you are certainly aware of the following facts regarding fluoridation. I assume that you have kept the city officials informed about this as they make decisions on this issue.

Fluoridation is a Waste of Tax Money

Read the truth produced in the best scientific information on fluoridation here: (www.fluoridealert.org). You will see a petition signed by almost 4000 professionals, including hundreds of dentists, hundreds of doctors, and other medical researchers calling on governments everywhere to stop fluoridation.

Even if fluoride was helpful to teeth, distributing any drug in drinking water is the most expensive and wasteful method. As a Civil Engineer, I know that people drink only 1/2% (one-half percent) of the water they use. The remaining 99 ½ % of the water with this toxic fluoride chemical ***(Hexafluorosilicic acid, which is waste material flushed directly from industrial smokestacks)*** is dumped directly into the environment through the sewer system.

For example, for every $1000 of fluoride chemical added to water, $995 would be directly wasted down the drain in toilets, showers, dishwashers, etc., $5 would be consumed in water by the people, and less than $0.50 (fifty cents) would be consumed by children, the target group for this outdated practice.
That would be comparable to buying one gallon of milk, using six-and-one-half drops of it, and pouring the rest of the gallon in the sink.

Fluoridation surely is in contention as the most wasteful government program. Giving away fluoride tablets free to anyone who wants them would be far cheaper and certainly more ethical, because then we would have the freedom to choose.

Janet Nyhof

From: Grace Isgro
Sent: Monday, January 16, 2012 1:48 PM
To: Janet Nyhof
Subject: FW: Letter to the Editor

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Monday, January 16, 2012 1:43 PM
To: Andrew Hill; Don Jenkins; Linda Murray; MAYOR EMAIL; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden
Subject: Fw: Letter to the Editor

1102 Kitchen SR
RR1 Coldwater ON

Open Letter to Dr. Charles Gardner
Medical Officer of Health
Simcoe County

January 16, 2012

Dr. Gardner:

RE: Medical officer of health defends fluoridation

In your recent letter to Orillia Packet and Times, you wrote, "I would urge all citizens of Orillia to be very careful in their selection of information sources." I agree.

I submit the following information from presumably reliable sources.

1. The Canadian Dental Association recommends that "preventing oral disease in children starts with good dental care habits."
You state, "Many residents do not have the means to obtain proper dental care". A good place to start would be dental clinics, free dental care for families in need, and an educational programme. Money spent this way targets the problem.

2. The U.S. Centers for Disease Control and Prevention (CDC 1999, 2001) acknowledges that the mechanism of fluoride's benefits are largely topical, not systemic.
There is no need to swallow fluoride. Why would a whole population be forced to swallow fluoridated water when it is unnecessary, so controversial and potentially dangerous?

3. The U.S. National Institutes of Health funded a multi-million dollar study (Warren 2009) which found no relation between tooth decay and the amount of fluoride ingested by children.
Again, swallowing fluoride is unnecessary.

4. Twenty-four studies from China, Iran, India and Mexico have reported an association between fluoride exposure and reduced IQ.
Why impose reduced IQ on an entire population?

Further, there is just plain common sense.

1. Fluoride has been classified as a drug by the US Food and Drug Association. Many people choose not to swallow unnecessary drugs, especially one with so many possible side effects. Hip fractures in seniors, bone damage, bone cancer, brain damage, reproductive problems, have all been reported as possible side effects of fluoride ingestion. Infants, the elderly and diabetics may be particularly sensitive to the negative effects of fluoride.

2. Fluoride may leach lead from pipes, brass fittings, soldered joints. Will children will be exposed to lead?

3. The drug dose of fluoride for each individual cannot be controlled. It's unknown how much water each person drinks, or whether a particular child would drink water at all, or how much fluoride one is exposed to from other sources. Fluoride accumulates in the body.

4. What are the effects on the ecosystem, including fish? "Fluoride is directly toxic to aquatic life." (BC Ministry of the Environment, 2011)

Many of us firmly believe that "No risk is acceptable when alternatives are available".

For a safer, healthier community,

C. M. O'Neill
705 686 7457

copied to: Dr. Gardner
Orillia City Councillors

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Monday, January 16, 2012 1:08 PM
To: JASON COVEY
Subject: Public Forum Fluoridation

Dear Jason,

Please register the Raging Grannies to present information at the Public Forum on Fluoridation of drinking water on Feb 29, 2012.

Thank you.

Colleen O'Neill
1102 Kitchen SR RR1 Coldwater ON L0K1E0
705 686 7457

From: Tammy Gouweloos [mailto:tamfragou@xplornet.com]
Sent: Tuesday, January 17, 2012 12:41 PM
To: JASON COVEY
Subject: fluoride public forum

Hello Jason,
I would like to give a presentation at the public forum on Feb 29th regarding Fluoridation of the Orillia City Drinking Water. With my experience as a dental hygienist of over 30 years, 16 of those years in Orillia, I feel I have much to offer to this decision.
Tammy Gouweloos, RDH
Barrie Dental Hygiene
11 Ferris Lane Suite 306
Barrie, ON L4M 5N6
705-722-0030
www.barriedentalhygiene.ca
info@barriedentalhygiene.ca

From: Scott Miller [mailto:scott.miller.3@gmail.com]
Sent: Wednesday, January 18, 2012 5:18 PM
To: JASON COVEY
Subject: FLUORIDATION OF CITY DRINKING WATER PUBLIC FORUM
Mr. Covey,

I would like to speak at the public forum on Feb.29.2012.

Name: Scott Miller
Address: 241 Nottawasaga Street, Orillia, ON, L3V 3K2
Email: scott.miller.3@gmail.com
Purpose: To share with the Council and the attending public the research of some medical doctors regarding the health effects of fluoride.

Thank you,

Scott

From: Tony Bridgens [mailto:tonybridgens@sympatico.ca]
Sent: Sunday, January 22, 2012 11:03 PM
To: JASON COVEY
Subject: Idea

Just wondering.....Do you have any mercury traps down in the wastewater plant to pick up any gold residue.....

Best regards

Tony Bridgens of
Betty and Tony's Waterfront B&B
677 Broadview Avenue
Orillia, ONTARIO
Canada L3V 6P1
001 705 326 1125
1 800 308 2579

From: dick ito [mailto:ddsihd@hotmail.com]
Sent: Monday, January 23, 2012 12:54 PM
To: JASON COVEY
Cc: bonnie.jeffrey@smdhu.org; megan.williams@smdhu.org
Subject: Registration for February 29, 2012 Public Forum

To Jason Covey:

I would like to register to make a formal presentation to the Orillia City Council on February 29, 2012 on the issue of Community Water Fluoridation. My presentation will provide information to the council and the public on the safety and effectiveness of Community Water Fluoridation.

Name: Dick Ito DDS, MSc, FRCD(C)
Position: Past-President
Organization: Ontario Association of Public Health Dentistry
Address: 51 Heath St. West, Toronto, Ontario M4V 1T2
Phone: 647-688-2998
e-mail: ddsihd@hotmail.com

Please let me know if you require any more information. Thank you for your consideration.

Dick Ito DDS, MSc, FRCD(C)
Dental Consultant

From: Alice den Otter [mailto:adenotte@lakeheadu.ca]
Sent: Monday, January 23, 2012 2:54 PM
To: JASON COVEY
Subject: Fluoride Presentation

Hi Jason,

My husband and I would like to make a formal presentation regarding fluoridation of drinking water in Orillia on February 29, 2012.

Details are as follows:

Alice den Otter and John Brown
21 Pearl Drive
Orillia Ontario
L3V 0A5
705-329-8507
adenotte@lakeheadu.ca

Purpose of presentation: 1) To persuade Orillia City Council **NOT** to fluoridate the water, and 2) to offer alternative options to help improve children's dental health.

Thank you,
Alice

From: Keith Morley [mailto:keithmorley@rogers.com]
Sent: Monday, January 23, 2012 10:25 PM
To: JASON COVEY
Cc: Dr.Keith Morley
Subject: Professional Presentation

Mr. Covey,
This email is to advise you that I plan to make a professional presentation.
My name address etc. is below.
The presentation will be on the value of Fluoride to maintain Oral Health Care for Children. KM

Keith R. Morley
C.D .B.Sc. D.M.D. FRCD[C]
Board Certified Pediatric Dentist
200-300 lakeshore Dr.
Barrie ON Canada
L4N0B4
Office:705- 722-3213
Cell: 705-791-0591
Web site: www.kidsdentistry.ca

From: dianne orton [mailto:diniii@distributel.net]
Sent: Tuesday, January 24, 2012 11:39 PM
To: Jason Covey
Subject: Fluoridation Of City Drinking Water Public Forum Registration

Registration Information: Dianne Orton
357 Millard Street,
Orillia, Ontario
L3V 4H5
705-326-6329
diniii@distributel.net

The purpose of my registration is to enlighten our Mayor, City Council Members and the Citizens of Orillia on the dangers of Fluoridation.

From: Valerie Harmsworth [mailto:valharms@rogers.com]
Sent: Monday, January 30, 2012 12:02 PM
To: MAYOR EMAIL; Don Jenkins; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: say NO to fluoride

Mayor Orsi and councillors

The National Health Federation page below provides myriad links to reasons why we in Orillia should not even CONSIDER adding fluoride to our water. Please take some time to check out of few of them. This is important !

http://www.thenhf.com/page.php?id=23

Valerie Harmsworth
Orillia, ON
L3V5M6

-----Original Message-----
From: Peter Dance
Sent: Thursday, January 27, 2011 2:48 PM
To: 'drwalt1@gmail.com'
Cc: Bill Mindell; 'Ito, Dick'; bonnie.jeffrey@smdhu.org
Subject: FW: fluoridation of Orillia water

Walter

Your email was passed to me from the SMDHU for a response.

As background and to address most of your questions please review the two reports attached in one PDF document.

Further to a City/SMDHU teleconference on January 18 we currently plan to bring something before the new Council in April. This will be a refresher and to confirm that the new Council would like to pursue the course of public consultation.

As you are aware this is a controversial topic that is primarily a public health issue. The SMDHU is the appropriate advisory body to Council on this issue and the Public Works Department would be the delivery agent if it were to proceed. Our report provides some guidance on costs. The issues around worker safety are manageable. Public education on the pro and cons and some informed debate on the issues will be essential.

I hope this is helpful.

Peter Dance
Director of Public Works
City of Orillia
705 329 7246

From: Walter Ewing [mailto:drwalt1@gmail.com]
Sent: Thursday, January 20, 2011 9:08 PM
To: Ito, Dick
Cc: Jeffrey, Bonnie
Subject: fluoridation of Orillia water

Hello, Dr. Ito,
I am a retired physician. I was the acting MOH of the Simcoe County District Health Unit years ago, and an AMOH as well. The Board fired me after David Butler-Jones left. I was MOH in the Muskoka Parry Sound Health Unit when it existed (I quit when I realized that I was not the appropriate person for this).
I am active on the Environmental Advisory Committee in Orillia, a committee appointed by the council in Orillia to advise on environmental issues, and to give them a headsup on environmental issues.
I have been interested in fluoridation of municipal water for over 40 years, and as far as I can see, it is still recommended.
I have told the Advisory Committee that I will bring up the topic after I get back to Orillia from wintering in Florida. I did print them information Bonnie told me about on the Health Unit's website.
I know that money will be a major issue brought up to say it is not appropriate for a municipality to fund fluoridation.
Others may say it is not an environmental issue, so it is not appropriate for us to bring up the topic.
Some will take an attitude that indicates that "I'm alright Jack", and not consider the

effects of oral health problems in marginalized people as being something that they should be interested in.
Two have already said that they know that it causes fluorosis, and they can't consider starting to fluoridate the water.
Some of them may have open minds, and be willing to listen to arguments for and against fluoridation.
I will probably come up with lots of questions later. I have had no written comments or questions from any of the members of the Committee in response to the information I gave them earlier this month.
I do know that the cost is an issue, and wonder if you could steer me to information that would allow an estimate of capital costs and operating costs for a city the size of Orillia.
I have also been given notice that the safety of handling fluoride for workers in the water plant may be an issue as well.
I really appreciate any information you can give me on the cost and safety, and other points that will be made.

Walter Ewing

CITY OF ORILLIA

TO: Council Committee

FROM: Public Works

DATE: April 17, 2009

REPORT NO.: PW-09-036

SUBJECT: **Fluoridation of City Drinking Water**

Recommendation

THAT Council provide direction on this matter: either by receiving this report as information; or, by directing that staff, in conjunction with the Simcoe-Muskoka District Health Unit, develop and implement a public consultation process to consider implementation of fluoridation of City water.

Background

At the meeting of Council held on March 9, 2009, the Public Works Department was requested to report on the cost of implementing a fluoridation program in the City's water system. This request was made further to the Health Unit's report *Focus on Health STATS – Oral Health in Simcoe and Muskoka.*

Fluoridation of City water was considered in the sixties and again in the late eighties. In the most recent debate, there was considerable public concern and the City did not proceed to provide fluoridation.

City water naturally has some fluoride. The concentration in our water is approximately 0.1 mg/l. The optimal fluoride concentration in drinking water for the control of tooth decay is between 0.5 and 0.8mg/l according to the Ontario Ministry of the Environment, Technical Support Document for Ontario Drinking Water – Standards and Objectives and Guidelines, 2003, PIBS4449e01. The Maximum Allowable Concentration (MAC) under Schedule 2 of O.Reg 169/03 – Ontario Drinking Water Quality Standards made under the Safe Drinking Water Act is 1.5 mg/l.

Discussion

A quick review of material available on the internet will demonstrate that there is opposition to fluoridation in many areas. Those opposed to the practice of community water fluoridation question its safety and effectiveness. There is debate about what level of fluoridation is best for addressing the public health issue for children's dental development. Health Canada is reviewing reduction of its recommended optimal fluoride concentration of 0.8 to 1.0mg/l to

0.7mg/l. This will bring it within the optimal range recommended by the Ontario Ministry of Environment. The more emotional question is whether there should be fluoridation or not.

Annually, there are only a few calls to the City on fluoridation. However, we recently had a call from someone asking if we fluoridate our water – when advised that we do not they responded 'good, Orillia can stay on the list of places we may move to'. While the case supporting fluoridation is easy, there will be lots of concerns (real and imagined) on the other side (home dialysis, fluoride dosing equipment malfunction, industrial and commercial process problems, pets, water softeners, pools, laundry, impact on the ecosystem of our wastewater, etc.) Before formulating a recommendation we need to be able to answer these questions and have some informed public consultation.

The Simcoe-Muskoka District Health Unit is the body that has responsibility for public health issues and the City relies on them for advice. This is primarily a public health issue and the Public Works role would be implementation and operation. The Health Unit has confirmed that they would be able to assist with public consultation on this issue.

Financial Impact

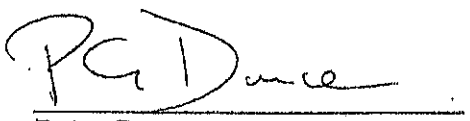
The cost of equipment to provide fluoridation of water in Orillia is modest. It is estimated that $50,000 would provide systems for both the Water Filtration Plant and the West Orillia Well. Annual operating costs would be expected to be in the $25,000 range.

There would be some modest costs associated with any public consultation that is undertaken.

Summary

While fluoridation of drinking water has demonstrated benefits for the dental health of children it is often a controversial subject. If Council would like to consider the implementation of fluoridation it would be best to provide for some informed public consultation prior to making a decision. The Health Unit would be an appropriate partner for such consultation.

Prepared and Recommended by:



Peter Dance
Director of Public Works

passed CC Oct 19/09

CITY OF ORILLIA

TO: Council Committee

FROM: Public Works Department

REPORT NO.: PW-09-082

DATE: October 9, 2009

SUBJECT: **Public Consultation on Fluoridation**

Recommendation

THAT the public consultation on fluoridation be deferred until 2011.

Background

Further to a request from Council, the Public Works Department reported on fluoridation in April of 2009 (PW-09-036). Subsequent to that report Council directed that staff, in conjunction with the Simcoe Muskoka District Health Unit, develop a public consultation process on fluoridation.

Discussion

We have had preliminary meetings to discuss content, schedule and resources for the proposed consultation. However, since the time of our pre-consultation with the Health Unit early in 2009 there have been two significant changes that affect their workload and capacity to deliver the consultation program on fluoridation. The pandemic virus H1N1 has created unplanned demands on Health Unit resources. Most recently, it has become apparent that the Health Unit will be the primary delivery agent for the upcoming vaccination program. The other unusual issue for the Health Unit is the expanding role they are required to take in the preparation for the G8 Summit in June of 2010.

Given the preparations needed and in anticipation of an active, and perhaps intense, consultation period on fluoridation we are proposing to defer the consultation until early in 2011.

Prepared and Recommended by:

P G Dance

Peter G. Dance, P. Eng.
Director of Public Works

From: Erin Meneray [mailto:E.Meneray@publichealthgreybruce.on.ca]
Sent: Tuesday, January 31, 2012 9:34 AM
To: Clerks Internet Email
Subject:

Good morning

Please see attached letter from Mr. Chris Munn, ASPHIO President

Thank you.

Mary Halliday

Mary Bawn Halliday
Executive Assistant to the Medical Officer of Health and Board of Health
Grey Bruce Health Unit
101 17th Street East
Owen Sound ON N4K 0A5
Phone: 519-376-9420 ext. 1241 **Fax:** 519-376-0605
Email: m.halliday@publichealthgreybruce.on.ca
Website: www.publichealthgreybruce.on.ca

ASPHIO

The Association of Supervisors of Public Health Inspectors of Ontario (Incorporated 1982)

January 27, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5

Dear Mayor Orsi and Council;

Re: The Association of Supervisors of Public Health Inspectors of Ontario (ASPHIO) supports City Council's implementation of community drinking water fluoridation in Orillia.

The Association of Supervisors of Public Health Inspectors of Ontario strongly supports your council on the fluoridation of the drinking water for the community of Orillia. ASPHIO members work closely with your colleagues on the Board of Health for the Simcoe Muskoka District Health Unit to provide expertise and management of many public health programs, including the Safe Water program. We are aware of the pressures faced by politicians to make good decisions particularly when small groups of committed opponents attempt to use the media to rally and influence public opinion. Fortunately, as community leaders, you have direct access to the accurate, scientific evidence that supports your community leadership in the recognition of the importance of drinking water fluoridation.

It is unfortunate that in recent years some of the greatest public health achievements of the 20th Century, including immunization against diseases, pasteurization of milk, and chlorination and fluoridation of drinking water have been targeted by small but very vocal groups able to put a media spin to their position. These groups take advantage of modern media messaging techniques to amplify their views to the point that public opinion can be radically influenced by unscientific and highly emotional, fear inducing messages. The public are being persuaded on the basis of this misinformation. Evidence would indicate that these choices are creating harm to public health. You have the opportunity to put the fluoride issue into proper perspective and to protect the health of Orillia citizens through your decision to implement community drinking water fluoridation.

Support from the scientific community is absolute. The Chief Medical Officer of Health for Ontario has clearly outlined the importance of drinking water fluoridation. She has stated that, *"The importance of maintaining good oral health should not be taken lightly – it is an important part of being healthy overall. As tooth decay is the single most common chronic disease among Canadians of all ages and poor oral health is linked to diabetes, heart disease and respiratory conditions, water fluoridation is, and must be recognized as, a very important public health measure".*

The weight of evidence supports municipal water fluoridation. ASPHIO would like to reiterate key facts that will assist you in educating your constituents:

- **Fluoride is one of the safest and most effective substances available for preventing tooth decay.**

- **More than 90 national and international professional health organizations** including Health Canada, the Canadian Public Health Association, the Canadian Dental Association, the Canadian Medical Association, the Centers for Disease Control and Prevention, the National Institutes of Health and the World Health Organization **endorse the fluoridation of drinking water to prevent tooth decay, especially among children. Their endorsement is based on solid scientific evidence built over many years by numerous experts.**

- **Research shows that fluoridated drinking water greatly reduces the number of cavities in children's teeth.** Tooth decay is the single most common chronic childhood disease.

- **Where fluoride has been added to municipal water supplies, there has been a marked decline in rates of tooth decay.**

- **Water fluoridation's significant advantage is that it benefits all residents in a community regardless of their socio-economic status or whether they have dental insurance.**

- **Community water fluoridation has been identified as one of the 10 great public health achievements of the 20th Century,** by the U.S. Centers for Disease Control and Prevention.

Your decision will have long-term effect on the health of your constituents. ASPHIO appreciates the opportunity to support you in your decision to implement community drinking water fluoridation in Orillia.

Sincerely,

Christopher Munn
ASPHIO President
Director of Operations and Program Development Grey Bruce Health Unit
101 17th Street East
Owen Sound, ON N4K 0A5

cc. Dr. Gardner, MOH, Simcoe Muskoka District Health Unit

From: Gerry Cooper [mailto:gwgcooper@gmail.com]
Sent: Monday, February 06, 2012 1:30 PM
To: JASON COVEY
Subject: Feb 29 Public Consultation on Fluoridation

Hello:

I am interested in making a presentation at this forthcoming meeting and would like to be registered for this purpose. I wish to address the Simcoe-Muskoka District Health Unit's dental health survey as presented in Figure 3 of its January 2009 Oral Health Report.

I am a resident of Severn Township which, as you know, has its main office in Orillia.

Regards,

Gerry Cooper

From: Carole Clinch [mailto:caclinch@gmail.com]
Sent: Wednesday, February 08, 2012 1:51 PM
To: JASON COVEY
Subject: Re: Update on City's Fluoridation Public Forum

Thank you again Jason. Will you present information as an act of due diligence?

Sincerely,

Carole

Due Diligence

Section 19 of the SDWA states that "every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system" has a responsibility to ensure "the protection and safety of the users of the municipal drinking water system". Municipal governments and staff have the legal responsibility (Ontario SDWA 2002, sections 11, 19, 20, 31) for determining whether the claims of safety for fluorosilicates used in drinking water are valid or not. **Access to full disclosure of product content and impurities** is essential to the water operator and all of those responsible for "the protection safety of the users of the municipal drinking water system."

We have clear evidence that the fluorosilicate products used by municipalities in drinking water do not satisfy the "prescribed standard" outlined in the Ontario Safe Drinking Water Act 2002, including statements made in deposition.

NSF International is a private consortium. Manufacturers, vendors and members of the supply chain of NSF certified products are **not required** to respond to requests from municipal councillors or water operators/professional engineers for evidence that their products **"certified" by NSF International** satisfy the NSF Standard 60 or the legal requirements ("**prescribed standard**") of the SDWA 2002. Furthermore, NSF International has a disclaimer (page iii of NSF Standard 60) stating that "NSF shall not incur any obligations or liability for damages" and that NSF International is "not responsible to anyone for the use of or reliance upon this Standard". Furthermore, "**Provisions for safety** have not been included in this Standard because **governmental agencies** or other national standards-setting organizations **provide safety requirements**."

Circular arguments

Neither the federal (Health Canada) nor the provincial (MOE) governments have provided "**provisions for safety**" for the fluorosilicate products put into drinking water. Both the federal and provincial governments claim no responsibility for the safety of fluorosilicate products. (see quotes below)

NSF claims that they are **not responsible** for these products and defer to "**governmental agencies**" for the provision of "**safety requirements**".

The federal and provincial government agencies state that they are **not responsible** for these products and defer to NSF International for "safety requirements".

Safety evidence relies on animal studies (toxicology studies) and human studies (clinical studies). We have neither toxicology studies nor clinical trials demonstrating safety for fluorosilicates.

In conclusion, no one is accountable for the safety of the fluorosilicate products used in drinking water.

Appendix

1. Regulation of drugs, health products, nutrients is a federal responsibility.

It is common knowledge that fluorosilicates are added to drinking water with the intent to prevent or treat dental cavities.

Definition of "Drug" in Food and Drugs Act:

> "includes any substance or mixture of substances manufactured, sold or represented for use in: the diagnosis, treatment, mitigation or prevention of a disease, disorder or abnormal physical state, or its symptoms, in human beings and animals".

The Supreme Court of Canada in 1957[1] ruled that fluoridation was a "compulsory preventive medication", which is "not to promote the ordinary use of water as a physical requisite for the body" but has a "special health purpose". This ruling has never been contested by the Canadian Government. Justice Cartwright opined that the policy of artificial water fluoridation is "ultra vires" for municipalities to put a product into drinking water used for specific health purposes: [emphasis added]

- **Supreme Court Justice Cartwright stated:** "In pith and substance the by-law relates not to the provision of a water supply but to the compulsory preventative medication of the inhabitants of the area. In my opinion, the words of the statutory provisions on which the appellant relies do not confer upon the council the power to make by-laws in relation to matters of this sort."
- **Supreme Court Justice Rand stated:** "But it is not to promote the ordinary use of water as a physical requisite for the body that fluoridation is proposed. That process has a distinct and different purpose; it is not a means to an end of wholesome water for water's function but to an end of a special health purpose for which water supply is made use of as a means."

Health Canada does not regulate fluorosilicates used in artificial water fluoridation

- **"**Health Canada does not regulate hexafluorosilicic acid or sodium silicofluoride products, the actual products used in water fluoridation, which are allegedly used as a medical treatment to prevent dental disease.**"**[2] [emphasis added]

Health Canada on their website state[3]:"The use of fluoride for the prevention of dental cavities" and "Fluoridation is a process of adjusting the concentration of fluoride to a level that provides the optimal dental benefits." [emphasis added]

Health Canada website[4]: “Water fluoridation is the process of adjusting the level of fluoride in the water to provide dental health benefits.” [emphasis added]

Conclusions:

Health Canada has failed to regulate fluorosilicates to determine safety of long-term use, but assures municipalities that they are "safe and effective" and spends taxpayer money promoting the use of these products.

Why has Health Canada abdicated any responsibility regarding the regulation and approval of fluorosilicates, put into drinking water?

- Natural Health Product Regulations 2007 included all fluoride products (which are not recommended for ingestion) for regulation. NHPD omitted fluorosilicates from regulation - which are recommended for ingestion.
- Fluorosilicates were grandfathered into existence - before the Food and Drugs Act was written.

The latest Health Canada Review of Fluoride did not review the toxicology of the actual products used – fluorosilicates.

1 Metropolitan Toronto v. Forest Hill (Village), [1957] S.C.R. 569
http://csc.lexum.umontreal.ca/en/1957/1957scr0-569/1957scr0-569.html

2 Petition #299, Answer #3, to Auditor General of Canada

3 Downloaded May14, 2011: http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/fluor-eng.php

4 Downloaded May 14, 2011: http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/fnihb-dgspni/ocdo-bdc/project-eng.php#a6

2. The province of Ontario does not regulate fluorosilicates used in drinking water.

> “MOE has no jurisdiction over the manufacture or sale of drinking water treatment chemicals.” *Source: June 11, 2007 email correspondence written by Mirek Tybinkowski, M.Eng., P.Eng, Water & Wastewater Specialist, Safe Drinking Water Branch, Ontario Ministry of the Environment.*
>
> “The MOE’s only authority lies in ensuring (in the approval and inspection processes) that fluoridation equipment is appropriately installed, operated and monitored.” *Source: Feb 18, 2009 email correspondence written by Mirek Tybinkowski, M.Eng., P.Eng, Water & Wastewater Specialist, Safe Drinking Water Branch, Ontario Ministry of the Environment.*

Letter from Steve Klose, Director, Standards Development Branch, Ministry of the Environment, dated Nov 25, 2011

Dear Ms. Clinch,

1. Are the products which are used in Ontario for artificial water fluoridation (Hexafluorosilicic acid and Sodium silicofluoride) regulated specifically under the Fluoridation Act of 1990?

Answer: The *Fluoridation Act* (1990) does not regulate products used for artificial water fluoridation.

2. Are the products which are used in Ontario for artificial water fluoridation (Hexafluorosilicic acid and Sodium silicofluoride) regulated specifically by the Ministry of the Environment under the Safe Water Drinking Act (2002) of Ontario?

Answer: The products used for artificial water fluoridation are not regulated by the *Safe Drinking Water Act* (2002).

3. Does the Ministry of the Environment have any jurisdiction over the manufacture and sale of products used as a medical treatment?

Answer: No. The manufacture and sale of products used for medical treatment do not fall within the scope of the Ministry of the Environment's mandate.

From: ruth.bednar@sympatico.ca [mailto:ruth.bednar@sympatico.ca]
Sent: Wednesday, February 08, 2012 3:40 PM
To: JASON COVEY
Subject: RE: Update on City of Orillia's Fluoridation Public Forum

Thank you, Jason, for the update on the City of Orillia's Fluoridation Public Forum.

Unfortunately, I will still be out of the country, however, I have presented three deputations, in Gravenhurst, at the Muskoka District Council, and at the Chair Board of Health in Barrie. All of this overwhelming substantiated information provided from independent health experts should be considered before a final decision.

A recently published book by independent top health professionals "The Case Against Fluoride" should at least get an honourable mention at the public forum.

Knowledge and awareness is in the public's best health interest.

Let not our freedom of choice be violated!

Sincerely,

Ruth Bednar
RHP RNCP ROHP

From: P. Van Caulart [mailto:pvancaulart@cogeco.ca]
Sent: Wednesday, February 08, 2012 8:58 PM
To: JASON COVEY
Subject: Re: City of Orillia's Fluoridation Public Forum

Jason:

Canadians Opposed to Fluoridation COF-COF.ca is the national body promoting the safe use of drinking water by eliminating fluoridation. We'd be pleased to register and participate at the Orillia public forum.

I have realized that I did not yet register for the forum before your deadline! Mea culpa. As a spokesperson for COF-COf it is important current information is presented to the public and is not dominated by one side pro or con. While I trust that a balance has been struck in the panel assembled, I assert that my assistance as both a one time proponent of fluoridation and now in opposition is beneficial to any public consultative process. I remain the only CDC fluoridation engineering course graduate in Ontario. Please consider adding my name to the register.

Sincerely,
Peter Van Caulart, Dip.A.Ed.,CES,CEI

Director, Environmental Training Institute
VP. COF-COF

From: James Reeves [mailto:james.reeves@lusfiber.net]
Sent: Monday, February 13, 2012 12:15 PM
To: JASON COVEY
Subject: RE: Update on City of Orillia's Fluoridation Public Forum
Importance: High

Jason:
Thank you for the meeting notice. I hope that your community will seek testimony from medical experts other than dentists. Dentists are obviously qualified in only the teeth and oral cavity, where fluoride causes damage to many other body organs: thyroid gland, pineal gland, bones, brain, joints, etc. Fluorosis of the teeth is simply the damage to the tooth enamel which is easily seen. This condition is severe in about 5% of children with cosmetic dental repairs costing as much as $30,000 and even more over a lifetime.
Who should pay for these damages?
Even the dental associations admit that infants should not consume fluoride.
Who is responsible for warning new mothers of this danger?
Who is responsible for warning everyone with kidney problems (diabetics and pre-diabetics) that they should avoid fluoride?

We all seek the truth in all things. I hope your community leaders do likewise.
Good luck in carrying out your duties.
James W. Reeves, Ph.D., P.E.

From: Tammy Gouweloos [mailto:tamfragou@xplornet.com]
Sent: Monday, February 13, 2012 2:52 PM
To: JASON COVEY
Subject: Re: City of Orillia Public Forum on Fluoridation - Presentation

Thank you Jason. I would like to see the list of presenters. I tried to find it online with no success.
Tammy Gouweloos, RDH
www.barriedentalhyiene.ca
705-722-0030

February 13, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
clerks@orillia.ca

Dear Mayor Orsi and Council,
Re: Public consultations into community water fluoridation

As a practicing Registered Dental Hygienist, I am pleased to learn of the proposal to bring community water fluoridation to the city and would like to offer my support to the approval and implementation of this plan.

Working within a dental practice, I see on a daily basis the detrimental effects that tooth decay can have on oral and overall health. Tooth decay can lead to many issues such as difficulty with eating, increased pain, trouble concentrating and decreased self-esteem and social skills.

Fluoridated water reaches all members of a community, regardless of age, financial status, or level of education. Unfortunately, proper regular dental care is not affordable to all. Water fluoridation reduces tooth decay by 20-40%. Systematic scientific reviews have shown no health concerns with optimally fluoridated water.

Community water fluoridation is also endorsed by organizations such a Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association as a proven safe and effective method of preventing tooth decay for the population.

As a professional who sees on a daily basis the detrimental effects of tooth decay, I encourage council to implement community water fluoridation.

Sincerely,

RDH

Corinne Sonnenberg

(DR HILL'S OFFICE)
705 326 7874

From: Walter Ewing [mailto:drwalt1@gmail.com]
Sent: Tuesday, February 14, 2012 4:56 PM
To: JASON COVEY
Cc: Jeffrey, Bonnie
Subject: Submission to public consultation on fluoridation

Dear Mr. Covey,
I am sending my submission in the body of this email and in a file attachment. If it would be better to send files as attachments, please let me know.
Thank you,

Walter Ewing, MD, MHSc, MBA
27 Carter Crescent
Orillia

February 14, 2012

Submission to Public Consultation on Fluoridation

I would like to submit my support for the fluoridation of our community water in Orillia.

The information that I am submitting is current, and well documented. I can provide the references for any statement that is in this submission.

Although there are a number of people who will submit objections to fluoridation, I would like to point out that two opposing sides do not necessarily have two compelling arguments.

I am presenting an abbreviated outline of the benefits of fluoridation, and some of the arguments used by antifluoridationists, and rebuttal to their arguments. See ”Myths and Facts” sent as an an attachment as a .pdf file.

I would like to propose that anti-fluoridationists carry with them an attitude that "allows them a peculiar and nasty vocabulary that seems to be taken as truth by virtue of the fact that it has been printed somewhere. Unfortunately, this also allows untruths, lies and malicious and personally driven dreck to be quoted as fact."

Benefits of Fluoridation

Water fluoridation prevents tooth decay mainly by providing teeth with frequent contact with low levels of fluoride throughout each day and throughout life. Even today, with other available sources of fluoride, studies show that water fluoridation reduces tooth decay by about 25 percent over a person’s lifetime.

Community water fluoridation is not only safe and effective, but it is also cost-saving and the least expensive way to deliver the benefits of fluoride to all residents of a community. For larger communities of more than 20,000 people, it costs about 50 cents per person to fluoridate the water in the United States. It is also cost-effective because

every $1 invested in this preventive measure yields approximately $38 savings in dental treatment costs.

This method of fluoride delivery benefits all people—regardless of age, income, education, or socioeconomic status. A person's income and ability to get routine dental care are not barriers since all residents of a community can enjoy fluoride's protective benefits just by drinking tap water and consuming foods and beverages prepared with it.

Fluoride from other sources prevents tooth decay as well, whether from toothpaste, mouth rinses, professionally applied fluoride treatments, or prescription fluoride supplements. These methods of delivering fluoride, however, are more costly than water fluoridation and require a conscious decision to use them.

MYTHS & FACTS

Responses to common anti-fluoride claims

For more information, go to ILikeMyTeeth.org

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Fluoride occurs naturally in water, though rarely at the optimal level to protect teeth.	*"Fluoride doesn't belong in drinking water."*	• It's already there. Fluoride exists naturally in virtually all water supplies and even in various brands of bottled water. If the people making this statement truly believed it, they would no longer drink water or grape juice — or eat shellfish, meat, cheese or other foods that contain trace levels of fluoride. • What's at issue is the amount of fluoride in water. There are proven benefits for public health that come from having the optimal level of fluoride in the water — just enough to protect our teeth. In 2011, federal health officials offered a new recommended optimal level for water fluoridation: 0.7 parts per million. That's our goal: getting just enough to help all of us keep our teeth longer.
Numerous scientific studies and reviews have recognized fluoride as an important nutrient for strong healthy teeth.	*"Adding fluoride is like forcing people to take medication"*	• Fluoride is not a medication. It is a mineral, and when present at the right level, fluoride in drinking water has two beneficial effects: preventing tooth decay and contributing to healthy bones. • U.S. court decisions have rejected the argument that fluoride is a "medication" that should not be allowed in water. The American Journal of Public Health summarized one of these rulings, noting that "fluoride is not a medication, but rather a nutrient found naturally in some areas but deficient in others." • There are several examples of how everyday products are fortified to enhance the health of Americans — iodine is added to salt, folic acid is added to breads and cereals, and Vitamin D is added to milk.
Fluoridation is one of the most cost-effective health strategies ever devised.	*"Our city council can save money by ending fluoridation of our water system."*	• A community that stops fluoridating or never starts this process will find that local residents end up spending *more* money on decay-related dental problems. Evidence shows that for most cities, every $1 invested in fluoridation saves $38 in unnecessary treatment costs. • A Texas study confirmed that the state saved $24 per child, per year in Medicaid expenditures because of the cavities that were prevented by drinking fluoridated water. • A Colorado study showed that water fluoridation saved the state nearly $149 million by avoiding unnecessary treatment costs. The study found that the average savings were roughly $61 per person.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Fluoridation is a public health measure where a modest community-wide investment benefits everyone.	*"Fluoridation is a 'freedom of choice' issue. People should choose when or if they have fluoride in their water."*	• Fluoride exists naturally in virtually all water supplies, so it isn't a question of choosing to get fluoride. The only question is whether people receive the optimal level that's documented to prevent tooth decay. • It is completely unrealistic to make water fluoridation a person-by-person or household-by-household choice. The cost efficiency comes from a public water system fluoridating its entire supply. • Maintaining an optimal amount of fluoride in water is based on the principle that decisions about public health should be based on what is healthy for the entire community, not based on a handful of individuals whose extreme fears are not backed by the scientific evidence. • Fluoridation is not a local issue. Every taxpayer in a state pays the price for the dental problems that result from tooth decay. A New York study found that Medicaid enrollees in counties where fluoridation was rare needed 33% more fillings, root canals, and extractions than those in counties where fluoridated water was much more prevalent.
Fluoridated water is the best way to protect everyone's teeth from decay.	*"We already can get fluoride in toothpaste, so we don't need it in our drinking water."*	• The benefits from water fluoridation build on those from fluoride in toothpaste. Studies conducted in communities that fluoridated water in the years after fluoride toothpastes were common have shown a lower rate of tooth decay than communities without fluoridated water. • The CDC reviewed this question in January 2011. After looking at all the ways we might get fluoride — including fluoride toothpaste — the CDC recommended that communities fluoridate water at 0.7 parts per million. Any less than that puts the health of our teeth at risk. • Fluoride toothpaste alone is insufficient, which is why pediatricians and dentists often prescribe fluoride tablets to children living in non-fluoridated areas.
Very high fluoride concentrations can lead to a condition called fluorosis. Nearly all fluorosis in the U.S. is mild. This condition does not cause pain, and does not affect the health or function of the teeth.	*"Fluoridation causes fluorosis, and fluorosis can make teeth brown and pitted."* and *"One-third of all children now have dental fluorosis."*	• Nearly all cases of fluorosis are mild — faint, white specks on teeth — that are usually so subtle that only a dentist will notice this condition. Mild fluorosis does not cause pain, and it does not affect the health or function of the teeth. • The pictures of dark pitted teeth that anti-fluoride opponents circulate show *severe* cases of fluorosis, a condition that is almost unheard of in the U.S. Many of these photos are from India, and the reason is *natural* fluoride levels over there that are dramatically higher than the level used in the U.S. to fluoridate public water systems. Common sense shows how misleading these photos are. Think about it: Do one-third of the children's teeth you see look brown and pitted? No, they don't. • In 2011, the CDC proposed a new level for fluoridation — 0.7 parts per million — that is expected to reduce the likelihood of fluorosis while continuing to protect teeth from decay.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Getting enough fluoride in childhood will determine the strength of our teeth over our entire lifetime.	*"Fluoride is especially toxic for small children."*	• According to the American Academy of Pediatricians optimal exposure to fluoride is important to infants and children. The use of fluoride for the prevention and control of cavities is documented to be both safe and effective. • Medical experts disagree with opponents' "toxic" claim. In fact, the American Academy of Family Physicians recommends that parents consider using dietary fluoride supplements for children at risk of tooth decay from ages 6 months through age 16 if their water isn't fluoridated. • Children who drink fluoridated water as their teeth grow will have stronger, more decay resistant teeth over their lifetime. A 2010 study confirmed that the fluoridated water consumed as a young child makes the loss of teeth (due to decay) less likely 40 or 50 years later when that child is a middle-aged adult.
Children who swallow toothpaste are at increased risk of mild fluorosis.	*"There's a warning label on fluoride toothpaste that tells you to 'keep out of reach of children', so fluoride in water must also be a danger."*	• The warning label simply reflects the fact that toothpaste contains roughly 1,000 times as much fluoride per milligram as fluoridated water. Even so, the American Dental Association (ADA) believes the warning label on toothpaste exaggerates the potential for negative health effects from swallowing toothpaste. The ADA has stated that "a child could not absorb enough fluoride from toothpaste to cause a serious problem" and noted that fluoride toothpaste has an "excellent safety record." • Many vitamin labels have similar statements: "Keep out of reach of children." That's because almost anything has the potential for negative health effects if it's left in the hands of unsupervised, young children.
Fluoridated water is safe for babies and young children.	*"Fluoridated water isn't safe to use for babies."*	• The evidence does not support what anti-fluoride groups say. The American Dental Association concludes that "it is safe to use fluoridated water to mix infant formula" and encourages parents to discuss any questions they may have with their dentists and pediatricians. • Although using fluoridated water to prepare infant formula might increase the chance that a child develops dental fluorosis, nearly all instances of fluorosis are a mild, cosmetic condition. Fluorosis nearly always appears as very faint white streaks on teeth. The effect is usually so subtle that only a dentist would notice it during an examination. Mild fluorosis does not cause pain, nor does it affect the function or health of the teeth. • A 2010 study examined the issue of fluorosis and infant formula, and reached the conclusion that "no general recommendations to avoid use of fluoridated water in reconstituting infant formula are warranted." The researchers examined the condition's impact on children and concluded that "the effect of mild fluorosis was not adverse and could even be favorable."

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Although Americans' teeth are healthier than they were several decades ago, many people still suffer from decay — and the overall impact it has on their lives.	*"Tooth decay is no longer a problem in the United States."*	• Tooth decay is the most common chronic health problem affecting children in the U.S. It is five times more common than asthma. Tooth decay causes problems that often last long into adulthood — affecting kids' ability to sleep, speak, learn and grow into happy and healthy adults. • California children missed 874,000 school days in 2007 due to toothaches or other dental problems. A study of seven Minneapolis-St. Paul hospitals showed that patients made over 10,000 trips to the emergency room because of dental health issues, costing more than $4.7 million. • Poor dental health worsens a person's future job prospects. A 2008 study showed that people who are missing front teeth are viewed as less intelligent and less desirable by employers. • In a 2008 study of the armed forces, 52% of new recruits were categorized as Class 3 in "dental readiness" — meaning they had oral health problems that needed urgent attention and would delay overseas deployment.
Leading health and medical organizations agree: fluoridated water is both safe and effective.	*"Fluoridation causes cancer and other serious health problems."*	• The American Academy of Family Physicians, the Institute of Medicine and many other respected authorities endorse water fluoridation as safe. The Centers for Disease Control and Prevention reports that "panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective." • More than 3,200 studies or reports had been published on the subject of fluoridation. Even after all of this research, the best that anti-fluoride groups can do is to claim that fluoride *could* cause or *may* cause one harm or another. They can't go beyond speculating because the evidence simply doesn't back up their fears. • The cancer claim is part of a pattern. According to the American Council on Science and Health, "Historically, anti-fluoride activists have claimed, with no evidence, that fluoridation causes everything from cancer to mental disease." • A 2011 Harvard study found no link between fluoride and bone cancer. This study reviewed hundreds of bone samples, and the study's design was approved by the National Cancer Institute. The study is significant because the National Research Council reported that ***if*** there were any type of cancer that fluoride might possibly be linked to, it would probably be bone cancer (because fluoride is drawn to bones). The fact that this Harvard study found no link to bone cancer strengthens confidence that fluoride is unlikely to cause any form of cancer. • Opponents usually cite a 2006 study when they raise the cancer issue, but they omit the fact that the author of this study called it "an exploratory analysis." Instead of measuring the actual fluoride level in bone, this 2006 study relied on estimates of fluoride exposures that could not be confirmed, which undermines the reliability of the data.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Dozens of studies and more than 60 years of experience have repeatedly shown that fluoridation reduces tooth decay.	*"Fluoridation doesn't reduce tooth decay."*	• An independent panel of 15 experts from the fields of science and public health reviewed numerous studies and concluded that fluoridation reduces tooth decay by 29%. • An analysis of two similarly sized, adjacent communities in Arkansas showed that residents without access to fluoridated water had twice as many cavities as those with access to fluoridated water. • In New York, Medicaid recipients in less fluoridated counties required 33% more treatments for tooth decay than those in counties where fluoridated water was prevalent. • The benefits of fluoridation are long-lasting. A recent study found young children who consumed fluoridated water were still benefiting from this as adults in their 40s or 50s. • The Centers for Disease Control and Prevention recognizes fluoridation's effectiveness in preventing tooth decay and cited fluoridated drinking water as one of the "10 great public health achievements of the 20th century." • The European Archives of Pediatric Dentistry published an analysis of 59 studies that concluded that "water fluoridation is effective at reducing [decay] in children and adults."
Millions of people living in Europe are receiving the benefits of fluoride.	*"European countries have rejected fluoridation, so why should we fluoridate water?"*	• Europe has used a variety of programs to provide fluoride's benefits to the public. Water fluoridation is one of these programs. Fluoridated water reaches 12 million Europeans, mostly residents of Great Britain, Ireland and Spain. Fluoridated milk programs reach millions of additional Europeans, mostly in Eastern Europe. • Salt fluoridation is the most widely used approach in Europe. In fact, at least 70 million Europeans consume fluoridated salt, and this method of fluoridation reaches most of the population in Germany and Switzerland. These two countries have among the lowest rates of tooth decay in all of Europe. • Italy has not tried to create a national system of water fluoridation, but the main reasons are cultural and geological. First, many Italians regularly drink bottled water. Second, a number of areas in Italy have water supplies with natural fluoride levels that *already* reach the optimal level that prevents decay. • Technical challenges are a major reason why fluoridated water isn't widespread in Europe. In France and Switzerland, for example, water fluoridation is logistically difficult because of the terrain and because there are tens of thousands of separate sources for drinking water. This is why Western Europe relies more on salt fluoridation, fluoride rinse programs and other means to get fluoride to the public.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Community water fluoridation is proven to reduce decay, but it isn't the only factor that affects the rate of tooth decay.	*"There are states with a high rate of water fluoridation that have higher decay rates than states where water fluoridation is less common."*	• Water fluoridation plays a critical role in decay prevention, but other factors also influence decay rates. Researchers often call these factors as "confounding factors." Someone who ignores confounding factors is violating a key scientific principle. A person's income level is a confounding factor in tooth decay because low-income Americans are more at risk for decay than upper-income people. This makes sense because income status shapes how often a person visits a dentist, their diet and nutrition, and other factors. • Comparing different states based solely on fluoridation rates ignores key income differences. For example, West Virginia and Connecticut reach roughly the same percentage of their residents with fluoridated water — 91 percent and 90 percent, respectively. Yet the percentage of West Virginians living below the poverty line is nearly double the percentage of those living in Connecticut. West Virginians are also more likely to get their drinking water from wells, which are not fluoridated to the optimal level. • It's misleading to compare states without considering other, confounding factors. A much more reliable approach is to compare residents of the *same* state who share similar traits, such as income levels. A 2010 study of New York counties did just this and found that people living in areas with fluoridated water needed fewer fillings and other corrective dental treatments.
Community water fluoridation is the most cost-effective way to protect oral health.	*"There are better ways of delivering fluoride than adding it to water."*	• A 2003 study of fluoridation in Colorado concluded that "even in the current situation of widespread use of fluoride toothpaste," water fluoridation "remains effective and cost saving" at preventing cavities. • Studies conducted in communities that fluoridated water in the years after fluoride toothpastes were widely used have shown a lower rate of tooth decay than communities without fluoridated water. • The co-author of a 2010 study stated that research confirms the "the most effective source of fluoride to be water fluoridation." • Water fluoridation is inexpensive to maintain and saves money down the road. The typical cost of fluoridating a local water system is between 40 cents and $2.70 per person, per year — less than the cost of medium-sized latte from Starbucks. • For low-income individuals who are at higher risk of dental problems, fluoride rinses are a costly expense, which is why these products are not the "easy" answer that opponents of fluoridation claim they are.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Water fluoridation has been one of the most thoroughly studied subjects, and the evidence shows it is safe and effective.	*"The National Research Council's 2006 report said that fluoride can have harmful effects."*	• The NRC raised the possibility of health concerns about areas of the U.S. where the *natural* fluoride levels in well water or aquifers are unusually high. These natural fluoride levels are two to four times higher than the level used to fluoridate public water systems. • The National Research Council itself explained that its report was <u>not</u> an evaluation of the safety of water fluoridation. • The Centers for Disease Control and Prevention reviewed the NRC report and stated, "The report addresses the safety of high levels of fluoride in water that occur naturally, and does not question the use of lower levels of fluoride to prevent tooth decay."
Anti-fluoride groups cite many "studies" that were poorly designed, gathered unreliable data, and were not peer-reviewed by independent scientists.	*"Studies show that fluoride is linked to lower IQ scores in children."*	• The foreign studies that anti-fluoride activists cite involved fluoride levels that were at least double or triple the level used to fluoridate drinking water in the U.S. It is irresponsible to claim these studies have any real meaning for our situation in the U.S. • British researchers who evaluated these studies from China and other countries found "basic errors." These researchers pointed out that the lower IQs could be traced to other factors, such as arsenic exposure, the burning of high-fluoride coal inside homes and the eating of contaminated grain.
Much of the fluoride used to fluoridate public water systems is extracted from phosphate rock.	*"Fluoride is a by-product from the phosphate fertilizer industry."*	• Much of the fluoride used to fluoridate water is extracted from phosphate rock, and so is phosphoric acid—an ingredient in Coke and Pepsi. After fluoride is extracted from phosphate rock, much of that rock is later used to create fertilizers that will enrich soil. Opponents use this message a lot, maybe because they want to create the false impression that fluoride comes from fertilizer. • Corn produces several useful by-products, including corn oil, cornstarch and corn syrup. Fluoride is one example of many by-products that help to improve the quality of life or health.

A Summary of Key Sources:

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Readey v. St. Louis County Water Co., supranote 25 at 628, 631 for the court's statement that it could not assume that the addition of 0.5 parts per million of fluoride to water that already contained 0.5 parts per million would result in infringement of any constitutional rights; Roemer, Ruth. "Water Fluoridation PH Responsibility and the Democratic Process." American Journal of Public Health. Vol. 55 (9), 1965. (2) Chapman v. City of Shreveport, supra note 25 at 146.

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Nadereh Pourat and Gina Nicholson, “Unaffordable Dental Care Is Linked to Frequent School Absences,” Health Policy Research Brief. (UCLA Center for Health Policy Research, Los Angeles, California) November 2009.

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Thomas M. Leiendecker, Gary C. Martin et al., “2008 DOD Recruit Oral Health Survey: A Report on Clinical Findings and Treatment Need,” Tri-Service Center for Oral Health Studies, (2008) 1 (accessed August 19, 2010).

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National Cancer Institute Website. Water Fluoridation Fact Sheet. http://www.cancer.gov/cancertopics/factsheet/Risk/fluoridated-water Accessed July 28, 2010.

Dr. Bill Bailey, CDC Podcast 7/17/2008. http://www2c.cdc.gov/podcasts/player.asp?f=9927#transcript

National Health and Medical Research Council (Australia) (2007). “A systematic review of the efficacy and safety of fluoridation” (PDF). http://www.nhmrc.gov.au/PUBLICATIONS/synopses/_files/eh41.pdf.

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Texas Department of Oral Health Website. www.dshs.state.tx.us/dental/pdf/fluoridation.pdf.

U.S. Department of Health and Human Services (USDHHS). Review of fluoride benefits and risks: report of the Ad Hoc Subcommittee on Fluoride of the Committee to Coordinate Environmental Health and Related Programs. Washington: U.S. Department of Health and Human Services, Public Health Service; 1991.

“Ten Great Public Health Achievements – United States, 1900-1999,” Centers for Disease Control and Prevention, 1999, http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm.

Guidelines on the use of fluoride in children: An EAPD policy document. European Archives of Pediatric Dentistry, 10 (3), 2009.

The British Fluoridation Society, The UK Public Health Association, The British Dental Association, The Faculty of Public Health of the Royal College of Physicians. “One in a million—the facts about water fluoridation.” Manchester, England, 2004.

National median fee for a two-surface amalgam (silver) filling among general dentists. (Procedure code D2150, amalgam, two surfaces, primary or permanent.) See American Dental Association, “2007 Survey of Dental Fees”; Centers for Disease Control and Prevention, Division of Oral Health, “Cost Savings of Community Water Fluoridation” (August 9, 2007), http://www.cdc.gov/fluoridation/fact_sheets/cost.htm.

CDC Fluoridation Website. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm.

Report of the Fort Collins Fluoride Technical Study Group, (April 2003).

From: Ryan de Laplante [mailto:rdelaplante@gmail.com]
Sent: Thursday, February 16, 2012 9:49 AM
To: Janet Nyhof
Subject: Public consultation on water fluoridation

Hi,

I am a former Orillia resident, and most of my family still lives in Orillia. I recently became aware of an effort to bring water fluoridation to Orillia. I urge all councilors to look at both sides of the science. A great place to read about why water should not be fluoridated:
http://www.fluoridealert.org

They have produced a thirty minute documentary titled "Professional Perspectives on Water Fluoridation":

http://www.fluoridealert.org/videos.aspx

It is important to note that one of the board members of the Fluoride Action Network is Dr. Hardy Limeback, DDS, PhD, Head, Preventive Dentistry, University of Toronto & Former President, Canadian Association for Dental Research, Canada.

Dr. Limeback was interviewed in the documentary and says that "it doesn't work by swallowing it". Fluoride is only beneficial when applied topically with toothpaste or a concentrated rinse. The documentary also talks about the proven dangers of using fluoridated water in infant formula.

A point I like to make is that fluoride is a medication, and by adding it to the water you will be forcing medication on all citizens, including those who agree with the hundreds of scientific studies from around the world that oppose fluoridating water.

Most of Europe does not fluoridate water. Many communities around the USA have stopped fluoridating their water. A partial list of Canadian cities that have stopped fluoridating include Calgary, Waterloo, Thunder Bay, Dryden, Amherstburg, Moncton, Gatineau, Quebec City, and Kamloops. Please do you research and find out why these cities have chosen to stop fluoridating their water against the recommendations of the government.

http://www.fluoridealert.org/communities.aspx

Thanks,
Ryan de Laplante

From: Maureen Jones [mailto:maureenj@pacbell.net]
Sent: Thursday, February 16, 2012 5:09 PM
To: Janet Nyhof
Subject: Fluoridation Fails the Poor Children

Dear Mayor and Councilmembers of Orillia, Canada

The University of California San Francisco School of Dentistry announced on December 18, 2008 they had received $24.4 million from National Institutes of Health to fight early childhood caries, aka baby bottle tooth decay/sippy cup tooth decay (because fluoridation is a failure).

Denver Post 4/13/04. (Denver fluoridated since '54)

"Sippy cups are the worst invention in history." Toddlers bed down with cups of juice/milk. It's a sleep-over party for mouth bacteria." Dr. Brad Smith treats about 300 cases/year of Early Childhood Caries.

Shiboski. *J Pub Health Dent*; Winter '03.
Our analysis of early childhood tooth decay did not appear to be affected by whether or not children lived in a fluoridated area.

Kelly. BBTD Among Native Americans. *J Pub Health Dent* '87.
BBTD in 18 communities of Head Start children was up to 85%. Regardless of water fluoridation, the prevalence of BBTD remained high at all sites surveyed.

Barnes. Baby Bottle Tooth Decay and Caries Prevalence of Head Start Children. *Public Health Reports*; 1992.
Children attending Head Start centers showed no significant differences based on fluoride status for the total sample or other variables.

I have ten more references that report the same results - fluoridation is a failure for poor Head Start children.

Sincerely,
Maureen Jones, Keepers-of-the-Well.org
1205 Sierra Ave.
San Jose, CA 95126
408 297-8487

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of colleenc@amtelecom.net
Sent: Thursday, February 16, 2012 5:35 PM
To: Peter Dance
Subject: fluoridation

Hello Peter,

Is there any way of removing fluoride from fluoridated water at the sewage treatment plant to prevent more fluoride from being discharged into the lakes? If so, what would be the cost of installing and per year?
Thank you.

Colleen O'Neill 705 686 7457

From: P. Van Caulart [mailto:pvancaulart@cogeco.ca]
Sent: Thursday, February 16, 2012 12:06 PM
To: JASON COVEY
Subject: Re: Presentation substitution at City of Orillia's Fluoridation Public Forum

Thanks for the accommodation Jason, good move. Sheldon Thomas will send you the email confirming the substitution. I'll have the info to you by Feb 24th as asked. See you soon.

Sincerely,

Peter Van Caulart, Director
Environmental Training Institute
VP, COF-COF

GEORGIAN
COLLEGE

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City of Orillia Clerk's Department
50 Andrew Street, South
Suite 300
Orillia ON, L3V 7T5

Dear Mayor Orsi and Council,

The Dental Health programs of Georgian College support the fluoridation of the city's water supply. We applaud City Council for considering this safe and effective means of improving the oral health of Orillia residents.

Georgian College prides itself in providing excellent education for future oral health care providers. Our students learn about the connection between oral health and overall health, as well as the impact on individuals and society when oral health is not achievable. Many people who cannot afford the cost of dental services, including professional fluoride applications, come to the dental clinics at Georgian College. This means our students see first-hand the consequences of a lack of prevention and regular care. Through these experiences, our students come to appreciate the disparities that exist within society and the need for public health initiatives, such as water fluoridation.

Tooth decay in children, adults and seniors is preventable and the most effective way to prevent tooth decay is through water fluoridation. By supporting water fluoridation, Council is ensuring all citizens benefit from this basic health promotion strategy.

The faculty and staff of the Georgian College Dental Health programs encourage Council to vote in support of water fluoridation for the City of Orillia.

Sincerely,

Jamieson

Linda Jamieson, Faculty

cc. President and CEO, Brian Tamblyn
Vice-President Academic, Linda Love
Dean, School of Health and Wellness, Dr. Cassandra Thompson
Associate Dean, School of Health and Wellness, Dr. Sean Madorin
Simcoe Muskoka District Health Unit

GEORGIAN
COLLEGE

One Georgian Drive,
Barrie, Ontario L4M 3X9
(T) 705-728-1968
(F) 705-722-5123
(E) info@georgianc.on.ca

Faculty & Staff Georgian College Dental Health Programs

We the undersigned support water fluoridation for the City of Orillia:

Name (printed)	Signature	Professional Designation
Joanne Farrell		Reg. Dental Hygienist.
Trudy Collinlin		Certified Dental Assistant Level II
Pat Rowan	P. Rowan.	Reg. Dental Hygienist
Sheila Koss		Reg Dental Hygienist
Melanie Patten	Patten	RDH
Pam Archer		registered Dental Hygie
Jennifer Wraith	Jennifer Wraith	Registered Dental Hygienist
Dawn Vincent		RDH

Dr. Robert Sullivan
2033 Big Chief Road
Orillia, Ontario L3V 6H3

February 7, 2012

Dear Mayor Orsi and Council,

On behalf of the Orillia and District Dentists, I would like to strongly support the initiative for fluoridation of the Orillia Municipal Water Supply. Fluoridated water is a Public Health policy that has a proven track record as a major contributor to the reduction in tooth decay in all communities that have proceeded with its application.

The people most susceptible to decay in our district are between three and eighteen years of age and they will benefit the most by receiving systemic fluoride. The overall effect of a fluoridated water supply is a reduction in the amount of decay, a decrease in the severity of the decay and significant improvement in the general resistance of all teeth to decay over a lifetime.

In my 35 years as a dental practitioner in Orillia there is no doubt that children who move here from fluoridated communities have significantly healthier dentitions with fewer decayed teeth than children from the Orillia community. In my opinion, this simple preventive measure in a short period of time, would start to decrease the general risk of decay for children in the city of Orillia and eventually match other communities' improved dental health experience.

Therefore, I strongly support a motion to fluoridate Orillia's water supply.

Sincerely,

Robert Sullivan DDS

From: W.S. Safety Technologies [mailto:mail@wssafety.com]
Sent: Saturday, February 18, 2012 9:47 AM
To: MAYOR EMAIL
Cc: Andrew Hill; Linda Murray; Michael Fogarty; Patrick Kehoe; Tony Madden; Paul Spears; Don Jenkins; Pete Bowen
Subject: Fluoridation in Orillia's Water

Attn: Mayor Angelo Orsi
My husband and I are herewith advising you and city council that we are 100% opposed to the fluoridation of Orillia's drinking water. When we moved to Orillia in 1988 with two small children we were relieved to find out that fluoride was not added to Orillia's water, as it was already a contentious issue at that time. Since then our children have gotten married, have both purchased homes with their spouses in Orillia, and we now have three grandchildren who were born in Orillia. We definitely do not want any of our family members and especially our grandchildren ingesting fluoride on a daily basis when the easy solution as far as teeth is concerned is to brush with fluoridated toothpaste. Please do not go against the tide of rational thinking, where major cities have recently opted out of fluoridation.
Thank you for your attention to this matter.
Regards,
Connie and Patrick Michels
221 Lawrence Avenue
Orillia, Ontario

Connie Michels
W.S. Safety Technologies
Orillia, Ontario, Canada
Web: www.wssafety.com
Email: mail@wssafety.com
Ph: 705-327-5787
Fx: 705-327-5788

From: dianne orton [mailto:diniii@distributel.net]
Sent: Tuesday, February 21, 2012 3:00 PM
To: Jason Covey
Subject: Re: City of Orillia Public Forum on Fluoridation
Importance: High

Attention: Jason Covey

Please get back to me ASAP in regards to which Fluoride Orillia will be using in the Water Fluoridation Program.
(1) Will it be a pharmaceutical grade, or an industrial grade?
(2) What is the actual chemical name of the product to be used?
(3) Location source of the product to be used ie. Canada, USA, China etc.

Sincerely
Dianne Orton

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of peaceofficer1@gmail.com
Sent: Tuesday, February 21, 2012 7:14 PM
To: Grace Isgro

Subject: Fluoridation of DRINKING water

Hello I would suggest a 'study of the preventative measures taken' (or NOT taken) by the families of the area in regards to 'DENTAL PROBLEMS' including tooth decay.
If there are 'family income factors' that contribute to a higher rate of tooth decay - for instance, this should be closely examined, and a determination made as to help alleviate the problem through whatever means are necessary.
This could be as basic as proper oral hygiene and adequate tooth brushing etc.
It may also reflect on dietary inadequacies.
We wouldn't add LEAD to our drinking water - which is in the same toxicity range as fluoride - why on Earth would we add fluoride?
Wake up Councillors and do your research, PLEASE.
Peter E Davenport TINY TOWNSHIP, ON

Fluoride Action Network | 802-338-5577 | health@fluoridealert.org

February 22, 2012

Dear Mayor Orsi and Council,

The office of Dr. Norin Siddiqi of Orillia is pleased to learn of the proposal to bring community water fluoridation to the city, and offers its full support to the approval and implementation of this plan.

As an agency that works directly with clients who face daily physical, mental and economic challenges, we know that their conditions create substantial barriers against maintaining good health. For many of them, dental care is beyond their financial means. Their poor dental health can spiral into further serious physical and mental health conditions.

Adding fluoride to Orillia's municipal water supply would amount to a few tenths of a percentage of the city's total budget (approximately $1 per person per year), but would provide an accessible means of protecting the oral health of the entire Orillia population, including the most vulnerable members of our community. The impact of this measure would have legacy benefits extending well beyond the term of this City council. Over the long term, tax savings could be realized by reducing the need for urgent dental care provided through the city's social services programs. No dollar figure can be affixed to the value of the long range health of today's population and of generations to come.

We urge the City of Orillia to bring fluoridation to the municipal water supply.

Sincerely,

Dr. Norin Siddiqi D.D.S.

190 Memorial Avenue, Suite J

Orillia, ON L3V 5X6

-----Original Message-----
From: clan vivian [mailto:morestuff135@gmail.com]
Sent: Wednesday, February 22, 2012 11:11 AM
To: MAYOR EMAIL
Subject: Floride in water

Attention Mayor and councell

Do not want floride in water supply!
We do not use floride toothpaste or have it applied by our dentist.
My daughter is 18 and has had 1 cavity in her life.
Floride is not needed please do not allow.

C Vivian
135 Cameron Street Orillia
705 327 6877

From: Sheldon Thomas [mailto:sheldon.thomas@clearwaterlegacy.com]
Sent: Wednesday, February 22, 2012 3:21 PM
To: JASON COVEY
Subject: Fluoridation Forum written submission
Importance: High

Good afternoon, Jason.

Please find attached my written submission to the fluoridation forum proceedings.

Thank you for your patience, and guidance.

Best regards,

Sheldon

Sheldon Thomas
Clear Water Legacy
www.clearwaterlegacy.com
(905) 333-9203

Dr. Amanda A. Bray

T 647 8222545
bray.amanda@gmail.com

February 23, 2012

Dear Mayor Orsi and Council,

As a new dentist in the community, I am pleased to learn of the proposal to bring community water flouridation to the city of Orillia. I offer full support to the approval and implementation of this plan.

Tooth decay is the most common chronic disease among all ages in Canada, and it doesn't have to be this way. Tooth decay is a preventable disease and daily exposure to topical fluoride is one of the best ways to strengthen tooth enamel, thereby reducing rates of decay.

Specific cases that come to mind personally are children with more than just a few simple cavities; rampant decay is not uncommon in Orillia and I find it very unfortunate to extract teeth and place large fillings in teeth where this could easily be prevented. Moreover, many patients with tooth decay do not have the financial means or dental education to access appropriate care when needed.

Adding fluoride to community water would provide an accessible means of protecting the oral health of the entire Orillia population, including the most vulnerable members of our community. The impact of this measure would have legacy benefits extending well beyond the term of the current City Council.

I strongly urge the City of Orillia to bring fluoridation to the municipal water supply.

Sincerely yours,

Dr. Amanda Bray, B.Sc., DDS
16 Rose Ave.

Received
Feb 29/12.

Fluoride: The Deadly Legacy

by Gary Null, Ph.D.

There's nothing like a glass of cool, clear water to quench one's thirst. But the next time you or your child reaches for one, you might want to question whether that water is in fact, too toxic to drink. If your water is fluoridated, the answer may well be yes.

For decades, we have been told a lie, a lie that has led to the deaths of hundreds of thousands of Americans and the weakening of the immune systems of tens of millions more. This lie is called fluoridation. A process we were led to believe was a safe and effective method of protecting teeth from decay is in fact a fraud.

In recent years it has been shown that fluoridation is neither essential for good health nor protective of teeth. What it *does* do is poison the body. Thus, some fundamental questions arise: 1) how is it possible that the public has all been misled? 2) why does public health policy and the American media continue to live with and perpetuate this scientific sham?

This History of Fluoride, a Toxic Waste

"We would not purposely add arsenic to the water supply. And we would not purposely add lead. But we do add fluoride. The fact is that fluoride is more toxic than lead and just slightly less toxic than arsenic."[1]

These words of Dr. John Yiamouyiannis may come as a shock to you because, if you're like most Americans, you have positive associations with fluoride. You may envision tooth protection, strong bones, and a government that cares about your dental needs. What you may not know is that the fluoride added to drinking water and toothpaste is a crude industrial waste product of the aluminum and fertilizer industries, and a substance toxic enough to be used as rat poison. How is it that Americans have learned to love an environmental hazard? This phenomenon can be attributed to a carefully planned marketing program launched even before Grand Rapids, Michigan, became the first community to officially fluoridate its drinking water in 1945.[2] As a result of this ongoing campaign, nearly two-thirds of the nation has enthusiastically followed Grand Rapids' example. But this push for fluoridation has less to do with a concern for America's health than with industry's penchant to expand at the expense of our nation's well-being.

What is Fluoride? Many people associate fluoride with its periodic table namesake, *fluorine.* While fluorine is an element (a gas that is frequently listed as a trace mineral and human nutrient), fluoride is very different. Fluoride is a compound of fluorine, and while fluorine is one of earths natural elements, fluoride is a chemical byproduct ("chemical byproduct" = toxic waste) of aluminum, phosphate, cement, steel, and nuclear weapons manufacturing.[3] Its toxicity was recognized at the beginning of the Industrial Revolution, when, in the 1850s iron and copper factories discharged it into the air and poisoned plants, animals, and people.[4]

In the early years of the 20th Century, a young dentist named Frederick McKay settled in Colorado Springs, Colorado. There he discovered that as many as 90% of lifetime residents of the town had grotesque brown stains on their teeth, and that the tooth enamel had an irregular

surface texture described as "mottled". Locals referred to the familiar condition as Colorado Brown Stain, but no one had a clue as to its cause. Over the next two decades Dr. McKay, later with the help of dental researcher G. V. Black, proved that the cause was something contaminating the water supply. They also speculated that the affected teeth might be somewhat more resistant to decay.[5]

By the 1920's, rapid industrial growth had exacerbated the problems of industrial pollution, and fluoride was one of the biggest problems. Medical writer Joel Griffiths explains that "it was abundantly clear to both industry and government that spectacular U.S. industrial expansion -- and the economic and military power and vast profits it promised -- would necessitate releasing millions of tons of waste fluoride into the environment."[6] Their biggest fear was that "if serious injury to people were established, lawsuits alone could prove devastating to companies, while public outcry could force industry-wide government regulations, billions in pollution-control costs, and even mandatory changes in high-fluoride raw materials and profitable technologies."[7]

In 1931, by means of photo-spectrographic analysis of McKay and Black's water samples conducted at the laboratories at the Aluminum Company of America (ALCOA), it was confirmed that the cause of the mottled teeth was fluoride in the water supply. ALCOA took a proprietary interest in this issue, since fluoride is a major waste product of aluminum production. The company wanted to know how much fluoride exposure people could tolerate without getting mottled, discolored teeth. Or, more specifically, how much fluoride could ALCOA release into the nation's earth, water, and air without the public realizing that the company was polluting the environment with a powerful toxin?[8]

That question was to be addressed later that same year, when H. Trendley Dean was sent to study water sources in 345 Texas communities. Dean, a former dental surgeon for the US Public Health Service, was then head of the Dental Hygiene Unit of the National Institute of Health. (Dean's overseer and mentor at the USPHS had been Treasury Secretary Andrew W. Mellon, a founder and major stockholder of ALCOA.) Based on his own research, Dean claimed that "fluoride levels of up to 1.0 ppm in drinking water did not cause mottled enamel; if the fluoride exceeded this level, however, fluorosis would occur."[9]

Dean, while establishing the threshold for fluoridation, also explored the idea that fluorosis victims mottled, discolored teeth were especially decay resistant. Dean suspected that 1ppm of fluoride added to the water supply would prevent tooth decay, while avoiding damage to bones and teeth.[10] He recommended further studies to determine whether his hypothesis was true.

According to Griffiths, the news that adding fluoride to the water supply for improved dental health was "galvanic", particularly to the Mellon Institute (ALCOA's Pittsburgh industrial research lab). Consequently, they initiated their own research. Biochemist Gerald J. Cox immediately fluoridated some lab rats in a study and concluded that fluoride reduced cavities and that: "The case should be regarded as proved." In a historic moment in 1939, the first public proposal that the U.S. should fluoridate its water supplies was made not by a doctor, or dentist, but by Cox, an industry scientist working for a company threatened by fluoride damage claims and burdened by the odious expense of disposing of tons of toxic industrial waste. Cox began touring the country, campaigning for fluoridation.[11]

Dean, meanwhile, continued his research and became the authority on public water fluoridation. He became the first dental scientist at the National Institute of Health, advancing to director of the dental research section in 1945. After World War II, he directed epidemiological studies for the Army in Germany. When Congress established the National Institute of Dental Research (NIDR) in 1948, Dean was appointed its director, a position he held until retiring in 1953.[12] In his post at the NIDR, oversaw the first clinical trial of fluoridation in an American city: Grand Rapids, Michigan.[13]

With Dean's impressive credentials, it is easy to assume—and many do—that his findings were scientifically sound. Unfortunately, Dean's "science", when placed under further scrutiny, is shaky, not solid; biased, not impartial, and above all, hardly a standard sound enough to launch mass fluoridation. An independent study of his results revealed that he had engaged in "selective use of data," employing figures from 21 cities that confirmed his findings, and ignoring those from 272 other localities that didn't.[14] In a 1955 court case challenging fluoridation, Dean admitted under oath that his published conclusions were wrong.[15] In hearings conducted by the AMA in 1957, he was forced to admit that dental fluorosis, the first sign of fluoride overdose, could be caused by water fluoridated at 1.0 ppm.[16] Shockingly, these admissions were not widely publicized, and they were never acknowledged by the USPHS, the American Dental Association, or the other governmental bodies responsible for foisting fluoride on the public. Consequently, this dangerous industrial waste carcinogenic is still dumped in our water today.

At first, industry could dispose of fluoride legally only in small amounts by selling it to insecticide and rat poison manufacturers.[17] But Dean's "discovery," paved the way for a commercial outlet for the toxin. Griffiths writes that this was not a scientific breakthrough, but rather part of a "public disinformation campaign" by the aluminum industry "to convince the public that fluoride was safe and good," Industry's need prompted Alcoa-funded scientist Gerald J. Cox to announce that "The present trend toward complete removal of fluoride from water may need some reversal."[18] Griffiths writes:

> "The big news in Cox's announcement was that this 'apparently worthless by-product' had not only been proved safe (in low doses), but actually beneficial; it might reduce cavities in children. A proposal was in the air to add fluoride to the entire nation's drinking water. While the dose to each individual would be low, 'fluoridation' on a national scale would require the annual addition of hundreds of thousands of tons of fluoride to the country's drinking water.
>
> "Government and industry - especially Alcoa - strongly supported intentional water fluoridation... [It] made possible a master public relations stroke - one that could keep scientists and the public off fluoride's case for years to come. If the leaders of dentistry, medicine, and public health could be persuaded to endorse fluoride in the public's drinking water, proclaiming to the nation that there was a 'wide margin of safety,' how were they going to turn around later and say industry's fluoride pollution was dangerous?
>
> "As for the public, if fluoride could be introduced as a health enhancing substance that should be added to the environment for the children's sake, those opposing it would look like quacks and lunatics....

"Back at the Mellon Institute, Alcoa's Pittsburgh Industrial research lab, this news was galvanic. Alcoa-sponsored biochemist Gerald J. Cox immediately fluoridated some lab rats in a study and concluded that fluoride reduced cavities and that 'The case should be regarded as proved.' In a historic moment in 1939, the first public proposal that the U.S. should fluoridate its water supplies was made - not by a doctor, or dentist, but by Cox, an industry scientist working for a company threatened by fluoride damage claims."[19]

Once the plan was put into action, industry was buoyant. They had finally found the channel for fluoride that they were looking for, and they were even cheered on by dentists, government agencies, and the public. Chemical Week, a publication for the chemical industry, described the tenor of the times when they exclaimed that: "All over the country, slide rules are getting warm as waterworks engineers figure the cost of adding fluoride to their water supplies." The article further explained that the general public quickly adhered to the new trend urged upon them by the U.S. Public Health Service, the American Dental Association, the State Dental Health Directors, various state and local health bodies, and vocal women's clubs from coast to coast. They further wrote that "[fluoridation] adds up to a nice piece of business on all sides and many firms are cheering the PHS and similar groups as they plump for increasing adoption of fluoridation."[20]

Such overwhelming acceptance allowed government and industry to proceed hastily, albeit irresponsibly. The Grand Rapids experiment was supposed to take 15 years, during which time health benefits and hazards were to be studied. In 1946, however, just one year into the experiment, six more U.S. cities adopted the process. By 1947, 87 more communities were treated; popular demand was the official reason for this unscientific haste.

The general public and its leaders did support the cause, but only after a massive government public relations campaign spearheaded by Edward L. Bernays, (a nephew of Sigmund Freud). Bernays, a public relations pioneer who has been called "the original spin doctor,"[21] was a masterful PR strategist. As a result of his influence, Griffiths writes, "Almost overnight...the popular image of fluoride -- which at the time was being widely sold as rat and bug poison -- became that of a beneficial provider of gleaming smiles, absolutely safe, and good for children, bestowed by a benevolent paternal government. Its opponents were permanently engraved on the public mind as crackpots..."[22]

Griffiths explains that while opposition to fluoridation is usually associated with right-wingers, this picture is not totally accurate. He provides an interesting historical perspective on the anti-fluoridation stance:

"Fluoridation attracted opponents from every point on the continuum of politics and sanity. The prospect of the government mass-medicating the water supplies with a well-known rat poison to prevent a nonlethal disease flipped the switches of delusionals across the country - as well as generating concern among responsible scientists, doctors, and citizens.

"Moreover, by a fortuitous twist of circumstances, fluoride's natural opponents on the left were alienated from the rest of the opposition. Oscar Ewing, a Federal Security Agency

administrator, was a Truman "fair dealer" who pushed many progressive programs such as nationalized medicine. Fluoridation was lumped with his proposals. Inevitably, it was attacked by conservatives as a manifestation of "creeping socialism," while the left rallied to its support. Later during the McCarthy era, the left was further alienated from the opposition when extreme right-wing groups, including the John Birch Society and the Ku Klux Klan, raved that fluoridation was a plot by the Soviet Union and/or communists in the government to poison America's brain cells.

"It was a simple task for promoters, under the guidance of the 'original spin doctor,' to paint all opponents as deranged - and they played this angle to the hilt....

"Actually, many of the strongest opponents originally started out as proponents, but changed their minds after a close look at the evidence. And many opponents came to view fluoridation not as a communist plot, but simply as a capitalist-style con job of epic proportions. Some could be termed early environmentalists, such as the physicians George L. Waldbott and Frederick B. Exner, who first documented government-industry complicity in hiding the hazards of fluoride pollution from the public. Waldbott and Exner risked their careers in a clash with fluoride defenders, only to see their cause buried in toothpaste ads."[23]

By 1950, fluoridation's image was a sterling one, and there was not much science could do at this point. The Public Health Service was fluoridation's main source of funding as well as its promoter, and therefore caught in a fundamental conflict of interest.[24] If fluoridation was found to be unsafe and ineffective, and laws were repealed, the organization feared a loss of face, since scientists, politicians, dental groups, and physicians unanimously supported it.[25] For this reason, studies concerning its effects were not undertaken. The Oakland Tribune noted this when it stated that "public health officials have often suppressed scientific doubts" about fluoridation.[26] Waldbott sums up the situation when he states that from the beginning, the controversy over fluoridating water supplies was "a political, not a scientific health issue."[27]

The clever marketing of fluoride continued. In a 1983 letter from the Environmental Protection Agency, then Deputy Assistant Administrator for Water, Rebecca Hammer, wrote that EPA's stance on fluoridation: " [the EPA] regards [fluoridation] as an ideal environmental solution to a long-standing problem. By recovering by-product fluosilicic acid from fertilizer manufacturing, water and air pollution are minimized and water utilities have a low-cost source of fluoride available to them."[28] More recently, a 1992 policy statement from the Department of Health and Human Services says, "A recent comprehensive PHS review of the benefits and potential health risks of fluoride has concluded that the practice of fluoridating community water supplies is safe and effective."[29]

Today, nearly 250 million people worldwide drink fluoridated water, including about 130 million Americans in 9600 communities. Out of the 50 largest cities in the US, 41 have fluoridated water.[30]

To help celebrate fluoride's widespread use, the media recently reported on the 50th anniversary of fluoridation in Grand Rapids. Newspaper articles titled "Fluoridation: a shining public health

success"[31] and "After 50 years, fluoride still works with a smile"[32] painted glowing pictures of the practice. Had investigators looked more closely, though, they might have learned that children in Muskegon, Michigan, a nearby un-fluoridated "control" city, had equal drops in dental decay. Had they looked closer, they would have seen the dangerous truth behind the supposed wonder of fluoride.

The Fluoride Myth Doesn't Hold Water

The big hope for fluoride was its ability to immunize children's developing teeth against cavities. Rates of dental caries were supposed to plummet in areas where water was treated. Yet decades of experience and worldwide research have contradicted this expectation numerous times. Here are just a few examples:

- In British Columbia, only 11% of the population drinks fluoridated water, as opposed to 40-70% in other Canadian regions. Yet British Columbia has the lowest rate of tooth decay in Canada. In addition, the lowest rates of dental caries within the province are found in areas that do not have their water supplies fluoridated.[33]
- According to a Sierra Club study, people in un-fluoridated developing nations have fewer dental caries than those living in industrialized nations. As a result, they conclude that "fluoride is not essential to dental health."[34]
- In 1986-87, the largest study on fluoridation and tooth decay ever was performed. The subjects were 39,000 school children between 5 and 17 living in 84 areas around the country. A third of the places were fluoridated, a third were partially fluoridated, and a third were not. Results indicate no statistically significant differences in dental decay between fluoridated and un-fluoridated cities.[35] The benefit to fluoridated communities, if there is any, amounts to 0.6 fewer decayed tooth surfaces per child, which is less than one percent of the tooth surfaces in a child's mouth.[36]
- A World Health Organization survey reports a decline of dental decay in western Europe, which is 98% un-fluoridated. They state that western Europe's declining dental decay rates are equal to and sometimes better than those in the U.S.[37]
- A 1992 University of Arizona study yielded surprising results when they found that "the more fluoride a child drinks, the more cavities appear in the teeth."[38]
- Although all Native American reservations are fluoridated, children living there have much higher incidences of dental decay and other oral health problems than do children living in other U.S. communities.[39]
- A 1999 study of water fluoridation in Italy shows that parents' socioeconomic status, area of residence, and children's sweets consumption are more significant predictors of dental caries than fluoride consumption. The authors conclude that universal fluoridation is an inadequate approach and the decision to fluoridate or de-fluoridate water requires careful epidemiological consideration.[40]
- A 2001 article in the Journal of the American Dental Association admits that the fluoride that is swallowed and incorporated into teeth is "insufficient to have a measurable effect" on reducing cavities.[41] This is a stunning admission from the ADA, historically one of the principal supporters and defenders of water fluoridation.

- A follow-up of a study of the town of Kuopio, Finland six years after fluoridation was discontinued found no increase in dental caries. The authors conclude that fluoridation was unnecessary to begin with.[42]
- A study comparing prevalence and incidence of caries in 2,994 life-long residents of British Columbia, Canada, in grades 5, 6, 11, 12, found that caries incidence was not different between the still-fluoridating and fluoridation-ended communities.[43]
- In 1997, following the cessation of drinking water fluoridation in La Salud, Cuba, caries prevalence remained at a low level for the 6- to 9-year-olds and appeared to decrease for the 10/11-year-olds. In the 12/13-year-olds, there was a significant decrease while the percentage of caries-free children of this age group had increased from 4.8 (1973) and 33.3 (1982) up to 55.2%.[44]
- A 1998 study conducted in New Zealand found that "when the timing of various forms of fluoride supplementation is correlated with the decline in caries, the decline continues beyond the time of maximum population coverage with fluoridated water and fluoridated toothpaste." The authors call for a "reassessment of the fluoride effect."[45]
- In contrast to the anticipated increase in dental caries following the cessation of water fluoridation in the German cities Chemnitz (formerly Karl-Marx-Stadt) and Plauen, a significant fall in caries prevalence was observed. This trend corresponded to the national caries decline and appeared to be a new population-wide phenomenon.[46]

A 1999 New York State Department of Health study of 3,500 7-14-year-olds shows that children in fluoridated Newburgh, New York, have no less tooth decay but significantly more dental fluorosis than children from Kingston, New York, which has never been fluoridated. Since 1945, children of the two towns have been examined periodically in order to demonstrate that fluoridation reduces tooth decay. "This new research shows the experiment has failed," the report concludes.[47] A similar comparison revealed that "In most European countries, where [water fluoridation] has never been adopted, a substantial decline [75%] in caries prevalence has been reported in the last decades".[48]

In light of all the evidence, fluoride proponents now make more modest claims. For example, in 1988, the ADA professed that a 40- to 60% cavity reduction could be achieved with the help of fluoride. Now they claim an 18- to 25% reduction. Other promoters mention a 12% decline in tooth decay.

And other former supporters are even beginning to question the need for fluoridation altogether. In 1990, a National Institute for Dental Research report stated that "it is likely that if caries in children remain at low levels or decline further, the necessity of continuing the current variety and extent of fluoride-based prevention programs will be questioned."[49] This is a startling claim coming from the very same governmental organization that spearheaded the drive for compulsory water fluoridation.

A 1999 review of literature conducted by Dr. Hardy Limeback, a long-time advocate of water fluoridation in Canada, indicates that the topical effect of fluoride is its primary mechanism for the prevention of dental caries. Swallowing fluoridated water is ineffective and unnecessary. Limeback concludes that everyone working in the dental health field must examine more closely the risks and benefits of fluoride in all its delivery forms.[50] According to Dr. Limeback, head of

preventive dentistry at the University of Toronto, 'Dental decay rates in North America are so low that water fluoridation provides little to no benefit whatsoever these days. In fact, studies show that when you turn the water fluoridation taps off and look for dental decay rates, they don't move whatsoever. There is no increase in dental decay when you stop fluoridating.[51] Limeback adds that what you do see is an increase in unsightly dental fluorosis.[52] Today fluorosis occurs on two or more teeth in 30% of children in areas where the water is fluoridated, and not all in its mildest form.[53]

In a letter published in 1999, dentist and public health official Dr. John Colquhoun, formerly one of New Zealand's most prominent pro-fluoridation advocates and educators, explains how over the course of years he came to recognize that there was no benefit in water fluoridation, and that children's dental health is slightly better in non-fluoridated areas than in fluoridated ones.[54] As another sign of the growing disillusionment with fluoridation, the National Institutes of Health conducted an intensive review of the data supporting fluoride in tap waters, looking at over 560 studies, and expressed in a 2001 news release their disappointment in "the overall quality of the clinical data that it reviewed. According to the panel, far too many studies were small, poorly described, or otherwise methodologically flawed."[55]

Most government agencies, however, continue to ignore the scientific evidence and to market fluoridation by making fictional claims about its benefits and pushing for its expansion. For instance, according to the U.S. Department of Health and Human Services, "National surveys of oral health dating back several decades document continuing decreases in tooth decay in children, adults and senior citizens. Nevertheless, there are parts of the country and particular populations that remain without protection. For these reasons, the USPHS...has set a national goal for the year 2000 that 75% of persons served by community water systems will have access to optimally fluoridated drinking water; currently this figure is just about 60%. The year 2000 target goal is both desirable and yet challenging, based on past progress and continuing evidence of effectiveness and safety of this public health measure."[56]

This statement is flawed on several accounts. First, as we've seen, research does not support the effectiveness of fluoridation for preventing tooth disease. Second, purported benefits are supposedly for children, not adults and senior citizens. At about age 13, any advantage fluoridation might offer comes to an end and less than 1% of the fluoridated water supply reaches this population.[57] And third, fluoridation has never been proven safe. On the contrary, numerous studies directly link fluoridation to disease, including skeletal fluorosis, dental fluorosis, thyroid disorders, brain and kidney damage, Alzheimer's disease, lead poisoning, and several rare forms of cancer. This alone should force us to reconsider its use.

Biological Safety Concerns

Only a small margin separates supposedly beneficial fluoride levels from amounts that are known to cause adverse effects. Dr. James Patrick, a former antibiotics research scientist at the National Institutes of Health, describes the predicament:

"[There is] a very low margin of safety involved in fluoridating water. A concentration of about 1 ppm is recommended. ...in several countries, severe fluorosis has been documented from water

supplies containing only 2 or 3 ppm. In the development of drugs... we generally insist on a therapeutic index (margin of safety) of the order of 100; a therapeutic index of 2 or 3 is totally unacceptable, yet that is what has been proposed for public water supplies."[58]

Other countries argue that even 1 ppm is not a safe concentration. Canadian studies, for example, imply that children under three should have no fluoride whatsoever. The Journal of the Canadian Dental Association states that "fluoride supplements should not be recommended for children less than 3 years old."[59] Since these supplements contain the same amount of fluoride as water does, they are basically saying that children under the age of three shouldn't be drinking fluoridated water at all, under any circumstance. Japan has reduced the amount of fluoride in their drinking water to one-eighth of what is recommended in the U.S. Instead of 1 milligram per liter, they use less than 15 hundredths of a milligram per liter as the upper limit allowed.[60]

The 1 ppm dosage recommendation for water fluoridation has a checkered past, and its present is even more so. As we have seen, the first mention of this "magic" number was made by Dr. Trendley Dean, who jiggled his results to reach the conclusion that "fluoride levels of up to 1.0 ppm in drinking water did not cause mottled enamel; if the fluoride exceeded this level, however, fluorosis would occur."[61]

But the adoption of this dosage for water fluoridation was not Dean's brainchild. It was set in 1953 by Dr. Harold C. Hodge, Ph.D., then chairman of the US National Academy of Sciences committee on toxicology. Unfortunately, Dr. Hodge made a serious miscalculation in his estimate of the safe dosage level for fluoride. His figures err by a factor of 2.25, which means that they understate the toxicity of fluoride considerably. The story of this potentially fatal miscalculation is told in a document from the UK National Pure Water Association:

> "It is important when any new drug is marketed that the dose at which it is toxic is determined. There is then a margin allowed for safety (usually a factor of 100) and a maximum dose is published. In 1953 the National Academy of Sciences published their estimate of the quantity of fluoride which produces the condition known as crippling skeletal fluorosis. The calculation was done by a famous toxicologist, Harold C. Hodge, Ph.D., who was chairman of the US National Academy of Sciences (NAS) committee on toxicology.
>
> To arrive at his figures, Hodge cited a classic study of the effects of fluoride among cryolite workers by a European researcher, Kaj Roholm, and published in 1937. Roholm's dosage figures were presented in milligrams of fluoride per kilogram of body weight. In his study, Roholm showed that at levels of 0.2 to 0.35mg/kg some workers developed crippling skeletal fluorosis in a very short time. The first stage of the disease appeared, in general, after 2 1Ž2 years; Stage two was reached by 4 1Ž2 years; and crippling skeletal fluorosis appeared after 11 years."[62]

Hodge wanted to apply Roholm's figures to a typical range of body weights in order to set a maximum intake level in milligrams per day. But Hodge was American and used to dealing in pounds rather than kilograms. By using a range of body weights from 100 to 229 pounds, he multiplied the 0.2 mg figure by 100 pounds, giving a figure of 20 mg/day; and 0.35 mg by 229

pounds yielded 80 mg/day. Thus the amounts of fluoride which would cause crippling skeletal fluorosis, he said, were 20mg to 80mg per day. And rather than quote Roholm's eleven year figure for crippling fluorosis, he gave a range of 10 to 20 years. These are the figures that appear in the American Dental Association's pamphlet, Fluoridation Facts, and on which many other articles are based, even today.

But Hodge made a simple but significant error. Roholm's figures were not for pounds. They were milligram per kilogram figures. Unfortunately, Hodge was the expert and no-one, apparently, checked his figures. This error, which gave a false safety margin more than double what it should have been went unnoticed for many years until anti-fluoride campaigner, Darlene Sherrell tried to duplicate Hodge's arithmetic and couldn't make it add up. She worked out that Hodge had made an error when he neglected to convert pounds to kilograms.

Correcting for this error, Sherrell reduced the amount of fluoride needed to be crippling to 10 to 25 milligrams per day, for 10 to 20 years.

But fluorides accumulate throughout our lives so a higher intake will have the same effect in a shorter time, and smaller doses will have the same effect in a longer time. If we apply Roholm's dosage figures to a lifetime of 55 to 96 years, just 1 mg per day (the amount in one liter of water) for each 55 pounds of body weight could be a crippling dosage.

The NAS Admits It Was Wrong

In 1989 Sherrell wrote to the NAS and asked on what they based their 20 to 80 mg/day figures. Two years passed before the Academy told her that they had identified Hodge's interpretation of Roholm as the data source.

Four years later the error was finally corrected by the National Research Council's Board on Environmental Studies and Toxicology in their 1993 publication, *Health Effects of Ingested Fluoride* where they changed the figure from 20-80mg/day to 10-20mg/day.[63]

As it happens, Hodge had written a chapter in a book released in 1979 entitled *Continuing Evaluation of the Use of Fluorides*. In it Hodge had corrected his previously published figures. But nobody seemed to notice. In 1991, when the US Department of Health and Human Services published their Review of Fluoride: Benefits and Risks, they continued to use figures of 20-80 mg/day as the 'crippling daily dose of fluoride'. As, indeed does the current RDA and Dietary Reference Intakes published by the Institute of Medicine in 1997.

Myths are Very Hard to Dislodge

We can get a good idea of how much fluoride is safe by working with Roholm's figures. You will remember that after the figures had been corrected, the amount needed to cause crippling fluorosis in a 100 to 229 lb person was reckoned to be 10 to 20 mg per day for 10 to 20 years. Since fluorides accumulate in a linear fashion, the crippling dosage of 10 mg per day for 10 years is the same as 5 mg per day for 20 years, and so on. If we extrapolate this to a normal lifetime with fluoridated water this is the same as 2.5 to 5 mg per day for 40 to 80 years. But we should

note that, for persons with kidney disease, the risk is greater because less fluoride will be eliminated by their malfunctioning kidneys.

It is also important to note that these figures are for crippling fluorosis, the last stage. It will take only four years at 10 mg/day, or sixteen years at 2.5 mg per day before a 100 pound individual can expect to experience phase 2, musculo-skeletal fluorosis, with chronic joint pain and arthritic symptoms - with or without osteoporosis. That is the amount of fluoride found in just 2 1Ž2 liters of water. And that's without counting the extra that today is inevitably found in foods, toothpaste, et cetera

From this it is clear that the only safe limit for fluoride is *none*.

Even supposing that low concentrations are safe, there is no way to control how much fluoride different people consume, as some take in a lot more than others. For example, laborers, athletes, diabetics, and those living in hot or dry regions can all be expected to drink more water, and therefore more fluoride (in fluoridated areas) than others.[64] Due to such wide variations in water consumption, it is impossible to scientifically control what dosage of fluoride a person receives via the water supply.[65]

In "50 Reasons to Oppose Fluoridation,"[66] Paul Connett, Ph.D., Professor of Chemistry at St. Lawrence University (NY) states that the supposedly safe fluoride levels in our water may pose a particular danger for any of the millions of people who suffer from thyroid disorders. He explains:

"Earlier in the 20th century, fluoride was prescribed by a number of European doctors to reduce the activity of the thyroid gland for those suffering from hyperthyroidism (over active thyroid)."[67]

With water fluoridation, we are forcing people to drink a thyroid-depressing medication which could serve to promote higher levels of hypothyroidism (under active thyroid) in the population, and all the subsequent problems related to this disorder. Such problems include depression, fatigue, weight gain, muscle and joint pains, increased cholesterol levels, and heart disease.

It bears noting that according to the Department of Health and Human Services (1991) fluoride exposure in fluoridated communities is estimated to range from 1.58 to 6.6 mg/day, which is a range that actually overlaps the dose (2.3 - 4.5 mg/day) shown to decrease the functioning of the human thyroid.[68] This is a remarkable fact, and certainly deserves greater attention considering the rampant and increasing problem of hypothyroidism in the United States. (In 1999 the second most prescribed drug of the year was Synthroid, a hormone replacement drug, which is used to treat an under active thyroid.) More than twenty million people in the U.S. receive treatment for thyroid problems and many others are thought to go undiagnosed.[69]

Today, 90% of the fluoride added to our drinking water is no longer a natural sodium fluoride compound. Today's fluoride is industrial waste that is complexed with silica or sodium. "Fluoride complexed with silica or sodium is readily ionized to free fluoride ions that are quickly absorbed in the gastrointestinal tract, whereas, when chemically bound to calcium, less of it ionizes and

less is absorbed. Calcium inhibits fluoride absorption and is, in fact, the treatment of choice for fluoride ingestion overdoses."[70]

Another concern is that fluoride is not found only in drinking water; it is everywhere. Fluoride is found in foods that are processed, which, in the United States, include nearly all bottled drinks and canned foods.[71] Researchers writing in The Journal of Clinical Pediatric Dentistry have found that fruit juices, in particular, contain significant amounts of fluoride. In a recent study, a variety of popular juices and juice blends were analyzed and it was discovered that 42% of the samples examined had more than 1 ppm of fluoride, with some brands of grape juice containing much higher levels - up to 6.8 ppm! The authors cite the common practice of using fluoride-containing insecticide in growing grapes as a factor in these high levels, and they suggest that the fluoride content of beverages be printed on their labels, as is other nutritional information.[72] Considering how much juice some children ingest, and the fact that youngsters often insist on particular brands that they consume day after day, labeling seems like a prudent idea.

Clean water activist Jeff Green points out that fluoride is "in Wheaties at 10 ppm, 10 times the amount that you find in water. It's in Post Grape Nuts and Shredded Wheat and Fruit Loops. These are items that people are eating all the time without realizing that it has fluoride in it. Because it's a pesticide residue that's allowed to be on produce now it's taken a big jump and the EPA has allowed it to be at really high levels, 180 ppm on a head of lettuce, 55 ppm on raisins. I mean no child is going to wash all that off."[73]

Prepared baby foods are a problem, too. A 1997 article in the Journal of the American Dental Association[74] warns that some baby foods contain such high levels of fluoride that babies who eat the food risk dental fluorosis. "Any infants who regularly eat more than a couple of ounces of infant foods containing high-fluoride-content chicken would be at elevated fluorosis risk," the authors conclude.[75] Infants who eat large quantities of dry infant cereals reconstituted with fluoridated water could ingest substantial quantities of fluoride from this source, this study shows. "Children should also be monitored to make sure that they do not ingest too much fluoride from other sources such as fluoride dentifrice, dietary fluoride supplements or fluoridated water...."[76]

Fluoride exposure during infancy can be expect to increase risk of fluoride-related illness, since a recent study shows that the first year of life is the most critical period for fluoride exposure. Children exposed during the first year of life, and to a lesser extent in the second year, are far more likely to develop fluorosis than those whose exposure begins later. The early mineralizing teeth-the central incisors and first molars-are most likely to be affected.[77]

This is confirmed by a recent study of fluorosis risk. "There is substantial evidence that fluoridated water, fluoride supplements, infant formulas, and fluoride toothpastes are risk factors for fluorosis," alone and together, reports Ohio State University researcher Dr. Ana Karina Mascarenhas.[78]

A recent study of fluoridated and non-fluoridated communities in Brazil proved that fluoride toothpaste contributes to fluorosis. In the study, children who started using fluoride before the

age of three were 4.43 times more likely to have dental fluorosis than those who started using it after the age of three.[79]

Dr. Connett observes that "the level of fluoride put into water (1 ppm) is 100 times higher than normally found in mothers' milk (0.01 ppm). There are no benefits, only risks, for infants ingesting this heightened level of fluoride at such an early age (this is an age where susceptibility to environmental toxins is particularly high)."[80]

Fluorosis get worse as a child approaches puberty, according to study done in Norway. The study showed a significant increase in the severity of fluorosis with increasing age in a high fluoride community, whereas no change in severity with age was observed in a low fluoride community. Fluorosis resulting from high fluoride content of drinking water increases between the ages of ten and fourteen.[81]

But beyond this is the larger issue that this study brings up: Is it wise to subject children and others who are heavy juice drinkers to additional fluoride in their water?

Here's a little-publicized reality: Cooking can greatly increase a food's fluoride content. Peas, for example, contain 12 micrograms of fluoride when raw and 1500 micrograms after they are cooked in fluoridated water, which is a tremendous difference. Furthermore, fluoride is an ingredient in pharmaceuticals, aerosols, insecticides, and pesticides.

And of course, toothpastes. It's interesting to note that in the 1950s, fluoridated toothpastes were required to carry warnings on their labels saying that they were not to be used in areas where water was already fluoridated. Crest toothpaste went so far as to write: "Caution: Children under 6 should not use Crest." These regulations were dropped in 1958, although no new research was available to prove that the overdose hazard no longer existed. Today, common fluoride levels in toothpaste are 1000 ppm. Research chemist Woodfun Ligon notes that swallowing a small amount adds substantially to fluoride intake. Dentists say that children commonly ingest up to 0.5 mg of fluoride a day from toothpaste.[82]

Dr. Hardy Limeback cites studies conducted by the toothpaste manufacturers showing that children under the age of six typically swallow as much as 60 percent of the toothpaste that goes into their mouths. "The warning labels, in my personal opinion, are there to get them off the hook in the next ten years. People who have been exposed to too much fluoride ingestion before the tubes were labeled have a case against the toothpaste companies. They weren't told that a lifetime of fluoride ingestion may be harmful."[83]

Which begs the question: How safe is all this fluoride? According to scientists and informed doctors, such as Dr. John Lee, it is not safe at all. Dr. Lee first took an anti-fluoridation stance back in 1972, when as chairman of an environmental health committee for a local medical society, he was asked to state their position on the subject. He stated that after investigating the references given by both pro- and anti-fluoridationists, the group discovered three important things:

"One, the claims of benefit of fluoride, the 60% reduction of cavities, was not established by any of these studies. Two, we found that the investigations into the toxic side effects of fluoride have not been done in any way that was acceptable. And three, we discovered that the estimate of the amount of fluoride in the food chain, in the total daily fluoride intake, had been measured in 1943, and not since then. By adding the amount of fluoride that we now have in the food chain, which comes from food processing with fluoridated water, plus all the fluoridated toothpaste that was not present in 1943, we found that the daily intake of fluoride was far in excess of what was considered optimal."[84]

What happens when fluoride intake exceeds the optimal? The inescapable fact is that this substance has been associated with severe health problems, ranging from skeletal and dental fluorosis to bone fractures, to fluoride poisoning, and even to cancer.

Dental Fluorosis

The publication Health Effects of Ingested Fluoride, put out by the National Academy of Sciences, reports that in areas with optimally fluoridated water (1 ppm, either natural or added), dental fluorosis levels in recent years ranged from 8 to 51%. Recently, a prevalence of slightly over 80% was reported in children 12-14 years old in Augusta, Georgia.[85] Other research gives higher figures. In a report entitled "Trends in Prevalence of Dental Fluorosis in North America," studies found that 35% to 60% of people living in fluoridated communities experience dental fluorosis, while non-fluoridated areas figure from 20% to 45%.[86]

Fluoride is a noteworthy chemical additive in that it's officially acknowledged benefit and damage levels are about the same. Writing in *The Progressive*, science journalist Daniel Grossman elucidates this point: "Though many beneficial chemicals are dangerous when consumed at excessive levels, fluoride is unique because the amount that dentists recommend to prevent cavities is about the same as the amount that causes dental fluorosis."[87] Although the American Dental Association and the United States Government consider dental fluorosis only a cosmetic problem, the American Journal of Public Health says that "...brittleness of moderately and severely mottled teeth may be associated with elevated caries levels."[88] In other words, in these cases the fluoride is causing the exact problem that it's supposed to prevent. Yiamouyiannis adds, "In highly naturally-fluoridated areas, the teeth actually crumble as a result. These are the first visible symptoms of fluoride poisoning."[89]

Also, when considering dental fluorosis, there are factors beyond the physical that you can't ignore - the negative psychological effects of having moderately to severely mottled teeth. These were recognized in a 1984 National Institute of Mental Health panel that looked into this problem.[90]

A telling trend is that TV commercials for toothpaste, and toothpaste tubes themselves, are now downplaying fluoride content as a virtue. This was noted in an article in the Sarasota/Florida ECO Report,[91] whose author, George Glasser, feels that manufacturers are distancing themselves from the additive because of fears of lawsuits. The climate is ripe for these and Glasser points out that such a class action suit has already been filed in England against the manufacturers of fluoride-containing products on behalf of children suffering from dental fluorosis. A major threat

when one considers that the CDC is reporting anywhere from 1/3 to1/2 of all school children in the US suffer from fluoride overdose and sport the pitted, discoloration of dental fluorosis.[92]

Still, certain segments of industry have yet to get the message. A recent newspaper ad campaign promotes Dannon's "Fluoride to Go" spring water "for kids who can't sit still."[93] Supplied in convenient kid-sized bottles with the pop-up "athletic" cap kids adore, the product perpetuates fluoride's false promise of better dental health for the new generation of kids for whom bottled water is more desirable than soda pop. The irony is that the shift from pop to water is one thing that does impact children's dental health significantly. Fluoride is totally out of place in this scenario. It makes one wonder how much fluoride might be in other brands of bottled water, including Evian and Volvic, which are owned by Dannon's parent company.

Skeletal Fluorosis

When fluoride is ingested, approximately 93% of it is absorbed into the bloodstream. A good part of the material is excreted, but the rest is deposited in the bones and teeth,[94] and is capable of causing a crippling skeletal fluorosis. This is a condition that can damage the musculoskeletal and nervous systems and result in muscle wasting, limited joint motion, spine deformities, and calcification of the ligaments, as well as neurological deficits.[95]

Large numbers of people in Japan, China, India, the Middle East, and Africa have been diagnosed with skeletal fluorosis from drinking naturally fluoridated water. In India alone, nearly a million people suffer from the affliction.[96] While only a dozen cases of skeletal fluorosis have been reported in the United States, Chemical and Engineering News states that "critics of the EPA standard speculate that there probably have been many more cases of fluorosis - even crippling fluorosis - than the few reported in the literature because most doctors in the U.S. have not studied the disease and do not know how to diagnose it."[97] Because some symptoms of skeletal fluorosis mimic those of arthritis, the first two clinical phases of fluorosis can be easily misdiagnosed.[98] According to Dr. Paul Connett, the causes of most forms of osteoarthritis are unknown. It is not implausible that the high prevalence of arthritis in America (42 million Americans have it) may be related to our high levels of fluoride intake.[99]

Dr. Hardy Limeback says, "We're quite concerned that fluoride accumulates through a lifetime of water fluoridation and causes the bone to become more brittle. We've started a study, and we're close to publishing it, that shows that people who have been exposed to just 20 to 30 years of water fluoridation have twice the amount of fluoride in their bones. Now there are all kinds of epidemiological studies to show that people who live in fluoridated areas have a higher risk for hip and other kinds of fractures, such as forearm fractures when they fall down. So this is quite a concern. I personally don't think that we need to be ingesting fluoride to protect our kids' teeth because they're already protected at a maximum. The rest of us are swallowing all this fluoride from the drinking water and possibly increasing the risk for bone fracture. It just doesn't make sense at all."[100]

Radiological changes in bone occur when fluoride exposure is 5 mg/day, according to the late Dr. George Waldbott, author of Fluoridation: The Great Dilemma. While this 5 mg/day level is the amount of fluoride ingested by most people living in fluoridated areas,[101] the number

increases for diabetics and laborers, who can ingest up to 20 mg of fluoride daily. In addition, a survey conducted by the Department of Agriculture shows that 3% of the U.S. population drinks 4 liters or more of water every day. If these individuals live in areas where the water contains a fluoride level of 4 ppm, allowed by the EPA, they are ingesting 16 mg/day from the consumption of water alone, and are thus at greater risk for getting skeletal fluorosis.[102]

Bone Fractures

At one time, fluoride therapy was recommended for building denser bones and preventing fractures associated with osteoporosis. Because fluoride has been strongly associated with bone fragility and breakage, several articles in peer-reviewed journals now suggest that fluoride actually causes more harm than good. Three studies reported in The Journal of the American Medical Association showed links between hip fractures and fluoride.[103, 104,105] Findings here were, for instance, that there is "a small but significant increase in the risk of hip fractures in both men and women exposed to artificial fluoridation at 1 ppm."[106] In addition, the New England Journal of Medicine reports that people given fluoride to cure their osteoporosis actually wound up with an increased non-vertebral fracture rate.[107] Austrian researchers have also found that fluoride tablets make bones more susceptible to fractures.[108] The U.S. National Research Council states that the U.S. hip fracture rate is now the highest in the world.[109]

A 2000 article in the journal Fluoride describes the bone effects of fluoride in detail.[110] Fluoride may increase bone quantity (osteofluorosis, osteosclerosis) but also decrease bone quality and bone strength. It is well known that pharmacological doses of fluoride increase the risk of torsion-type fractures (such as hip fractures) despite the appearance of greater bone density. Conventional medicine interprets the observed fluoride-induced increase of serum alkaline phosphatase concentration as a sign of osteoblast activity. Actually, it is a reflection of increased mortality of osteocytes within bone. Osteocytes are rich in alkaline phosphatase, which is released when the cells are killed by fluoride. It is unlikely, therefore, that a window of fluoride-induced bone benefit exists.[111]

Louis V. Avioli, professor at the Washington University School of Medicine, says in a 1987 review of the subject: "Sodium fluoride therapy is accompanied by so many medical complications and side effects that it is hardly worth exploring in depth as a therapeutic mode for postmenopausal osteoporosis, since it fails to decrease the propensity for hip fractures and increases the incidence of stress fractures in the extremities."[112]

Fluoride's deleterious effect on bone is well documented. Early experiments using large doses of fluoride as a treatment for osteoporosis had disastrous results. Dr. C. Rich warned that rather than strengthening bones, fluoride could cause osteoarthritis, as well as gastric pain, calcification of the arteries, and visual disturbances.[113]

Dr. Paul Connett cites two epidemiological studies suggesting a possible association with osteosarcoma, bone cancer, in young men living in fluoridated areas.[114] One is the report of the U.S. National Toxicology Program mentioned earlier, which first uncovered the epidemiological evidence of increased osteosarcoma in boys and young men living in fluoridated areas.[115] The second is a study conducted by the New Jersey Department of Health. Dr. Perry Cohn studied the

incidence of the rare bone cancer in seven New Jersey counties relative to water fluoridation. In fluoridated areas incidence of osteosarcoma in boys under the age of ten was 4.6 times higher than in un-fluoridated areas, 3.5 times higher in the 10 to 19 age group, and over twice as high in the 20 to 49 age group.[116]

Scientists at Yale University discovered that doses as low as 1 ppm of fluoride decrease bone strength and elasticity, making fracture more likely.[117] Another group of researchers found that fluoride accelerated the development of osteoporosis.[118] A 1992 study of elderly patients found 'a small but significant increase in the risk of hip fracture in both men and women exposed to artificial fluoridation at 1 part per million'. As with the bone cancer, the adverse effects of fluoride accumulation on bone strength were greater with men.[119]

Fluoride has the potential to increase skeletal mass to a greater extent than any other pharmacologic agent, yet it has proven difficult to translate this into therapeutic benefit for patients with low bone mass in diseases such as osteoporosis, according to a 1996 study by Michigan's Center for Osteoporosis Research. This apparent paradox can be explained in part by toxic actions of the ion on skeletal mineralization, impairment of the normal processes of bone re-absorption, and fluoride-induced decreases in strength per unit of bone (mass or volume).[120]

Belgian arthritis researchers reviewed thirty years clinical research on fluoride in the treatment of osteoporosis. They point out that fluoride has a dual effect on osteoblasts (the cells from which bones are made). On the one hand, it increases the birthrate of osteoblasts, while on the other hand it has a toxic effect on the individual cell with mineralization impairment and reduced apposition rate resembling osteomalacia. Fluoride has a positive effect on axial bone density, they say, but the axial bone gain is not matched by similar changes in cortical bone. (The cortical bone is the hard outer part of bone where a bone's main strength lies.)[121]

Among the studies cited, two show an increased rate of hip fracture among patients treated with high doses of fluoride (50-75 mg per day).[122,123]

In an experiment conducted with bovine bones, fluoride treatment reduced the mechanical strength of bone tissue by converting small amounts of bone mineral to mostly calcium fluoride. This action reduces the structurally effective bone mineral content and also possibly affects the interface bonding between the bone mineral and the organic matrix of the bone tissue.[124] A Polish study published in 1999 found that treatment with fluoridated water decreases the bending strength of the femoral neck and shaft in laboratory rats.

A New Zealand review of recent scientific literature reveals a consistent pattern of evidence--hip fractures, skeletal fluorosis, the effect of fluoride on bone structure, fluoride levels in bones and osteosarcomas--pointing to the existence of causal mechanisms by which fluoride damages bones. Public health authorities in Australia and New Zealand have appeared reluctant to consider openly and frankly the implications of this and earlier scientific evidence unfavorable to the continuation of the fluoridation of drinking water supplies.[125]

Dr. Connett reports that, of eighteen studies conducted since 1990, ten have found an association between water fluoridation and hip fractures in the elderly.[126] "One study found a dose-related

increase in hip fracture as the concentration of fluoride rose from 1 ppm to 8 ppm (Li et al, 1999, to be published). Hip fracture is a very serious issue for the elderly, as a quarter of those who have a hip fracture die within a year of the operation, while 50 percent never regain an independent existence."[127]

Fluoride Poisoning

In May 1992, 260 people were poisoned, and one man died, in Hooper Bay, Alaska, after drinking water contaminated with 150 ppm of fluoride. The accident was attributed to poor equipment and an unqualified operator.[128] Was this a fluke? Not at all. Over the years, the CDC has recorded several incidents of excessive fluoride permeating the water supply and sickening or killing people. We don't usually hear about these occurrences in news reports, but interested citizens have learned the truth from data obtained under the Freedom of Information Act. Here is a partial list of toxic spills we have not been told about:

- July 1993 -Chicago, Illinois: Three dialysis patients died and five experienced toxic reactions to the fluoridated water used in the treatment process. The CDC was asked to investigate, but to date there have been no press releases.
- May 1993 - Kodiak, Alaska (Old Harbor): The population was warned not to consume water due to high fluoride levels. They were also cautioned against boiling the water, since this concentrates the substance and worsens the danger. Although equipment appeared to be functioning normally, 22-24 ppm of fluoride was found in a sample.
- July 1992 -Marin County, California: A pump malfunction allowed too much fluoride into the Bon Tempe treatment plant. Two million gallons of fluoridated water were diverted to Phoenix Lake, elevating the lake surface by more than two inches and forcing some water over the spillway.
- December 1991 - Benton Harbor, Michigan: A faulty pump allowed approximately 900 gallons of hydrofluosilicic acid to leak into a chemical storage building at the water plant. City engineer Roland Klockow stated, "The concentrated hydrofluosilicic acid was so corrosive that it ate through more than two inches of concrete in the storage building." This water did not reach water consumers, but fluoridation was stopped until June 1993. The original equipment was only two years old.
- July 1991 - Porgate, Michigan: After a fluoride injector pump failed, fluoride levels reached 92 ppm and resulted in approximately 40 children developing abdominal pains, sickness, vomiting, and diarrhea at a school arts and crafts show.
- November 1979 - Annapolis, Maryland: One patient died and eight became ill after renal dialysis treatment. Symptoms included cardiac arrest (resuscitated), hypotension, chest pain, difficulty breathing, and a whole gamut of intestinal problems. Patients not on dialysis also reported nausea, headaches, cramps, diarrhea, and dizziness. The fluoride level was later found to be 35 ppm; the problem was traced to a valve at a water plant that had been left open all night.[129]

Instead of addressing fluoridation's problematic safety record, officials have chosen to cover it up. For example, the ADA says in one booklet distributed to health agencies that "Fluoride feeders are designed to stop operating when a malfunction occurs... so prolonged over-fluoridation becomes a mechanical impossibility."[130] In addition, the information that does reach

the population after an accident is woefully inaccurate. A spill in Annapolis, Maryland, placed thousands at risk, but official reports reduced the number to eight.[131] Perhaps officials are afraid they will invite more lawsuits like the one for $480 million by the wife of a dialysis patient who became brain-injured as the result of fluoride poisoning.

Not all fluoride poisoning is accidental. For decades, industry has knowingly released massive quantities of fluoride into the air and water. Disenfranchised communities, with people least able to fight back, are often the victims. Medical writer Joel Griffiths relays this description of what industrial pollution can do, in this case to a devastatingly poisoned Indian reservation:

"Cows crawled around the pasture on their bellies, inching along like giant snails. So crippled by bone disease they could not stand up, this was the only way they could graze. Some died kneeling, after giving birth to stunted calves. Others kept on crawling until, no longer able to chew because their teeth had crumbled down to the nerves, they began to starve...." They were the cattle of the Mohawk Indians on the New York-Canadian St. Regis Reservation during the period 1960-1975, when industrial pollution devastated the herd - and along with it, the Mohawks' way of life. ...Mohawk children, too, have shown signs of damage to bones and teeth."[132]

Mohawks filed suit against the Reynolds Metals Company and the Aluminum Company of America (Alcoa) in 1960, but ended up settling out of court, where they received $650,000 for their cows.[133]

Cancer

Numerous studies demonstrate links between fluoridation and cancer; however, agencies promoting fluoride consistently refute or cover up these findings.

Even in the earliest days of fluoridation there were clear indications of the fluoride-cancer link. In the early 1950s Dr. Alfred Taylor, a biochemist at the University of Texas conducted a series of experiments in which cancer-prone mice consuming water treated with sodium fluoride were found to have shorter life spans than similar mice drinking distilled water.[134] Taylor's studies were carried out twice, because after the first run the scientist himself discovered that the chow that his mice had eaten had itself contained fluoride, thus clouding the results. On his own initiative, Taylor ran the whole experiment a second time. The second run, with mice fed fluoride-free chow, was conclusive. Clearly fluoride could no longer be considered a harmless additive to drinking water.[135]

John Remington Graham and Pierre-Jean Morin, in their exhaustive survey of fluoridation litigation[136] observe that "Taylor's work was published at a politically sensitive time, because the last stages of the much-boasted surveys at Newburgh and Kingston were underway. The obvious meaning of Dr. Taylor's results was that a possible danger to human health had been overlooked, and that widespread fluoridation should be delayed until the situation had been clarified. However, the ADA and the USPHS had already endorsed and begun the drive to promote fluoridation."[137]

What happened next is a classic study in denial. The Final Report published by the authors of the Newburgh-Kingston study refers only to the results of Taylor's first round of tests, even though his second, conclusive round had been peer-reviewed and published over two years before. They wrote:

> "The reports by Alfred Taylor, a biochemist at the University of Texas, on the increased incidence of cancer in mice drinking fluoride treated water have been shown to be unfounded, since the food he was giving the mice had many times the fluoride content of drinking water, and the food was supplied to both the control and the experimental groups. Subsequent tests did not confirm the differences."[138]

And this same denial has been repeated over and over for the succeeding 45 years by the United States Public Health Service and its affiliates. Graham and Morin cite a standard history of the National Institute of Dental Research, published over 35 years later, alleging that Dr. Taylor refrained from publishing his findings "because he was unable to confirm those results in a second experiment."[139] The author of this fabrication goes on to say that "a literature search of scientific journals failed to show any publication of this work by Taylor...."[140] Legal scholars Graham and Morin comment: "The most powerful forensic evidence of the importance of Dr. Taylor's work is that the USPHS officials have done so much to conceal it."[141]

That was not to be the last study to reveal carcinogenic effects for fluoride, and it was not to be the last fluoride-related cover-up. In 1977, Dr. John Yiamouyiannis and Dr. Dean Burk, former chief chemist at the National Cancer Institute, released a study that linked fluoridation to 10,000 cancer deaths per year in the U.S. Their inquiry, which compared cancer deaths in the ten largest fluoridated American cities to those in the ten largest un-fluoridated cities between 1940 and 1950, discovered a 5% greater rate in the fluoridated areas.[142] The NCI disputed these findings, since an earlier analysis of theirs apparently failed to pick up these extra deaths. Federal authorities claimed that Yiamouyiannis and Burk were in error, and that any increase was caused by statistical changes over the years in age, gender, and racial composition.[143]

In order to settle the question of whether or not fluoride is a carcinogen, a Congressional subcommittee instructed the National Toxicology Program (NTP) to perform another investigation.[144] That study, due in 1980, was not released until 1990. However, in 1986, while the study was delayed, the EPA raised the standard fluoride level in drinking water from 2.4 to 4 ppm.[145] After this step, some of the government's own employees in NFFE Local 2050 took what the Oakland Tribune termed the "remarkable step of denouncing that action as political."[146]

When the NTP study results became known in early 1990, union president Dr. Robert Carton, who works in the EPA's Toxic Substances Division, published a statement. It read, in part:

> "Four years ago, NFFE Local 2050, which represents all 1100 professionals at EPA headquarters, alerted then Administrator Lee Thomas to the fact that the scientific support documents for the fluoride in drinking water standard were fatally flawed. The fluoride juggernaut proceeded as it apparently had for the last 40 years - without any regard for the facts or concern for public health.

EPA raised the allowed level of fluoride before the results of the rat/mouse study ordered by Congress in 1977 was complete. Today, we find out how irresponsible that decision was. The results reported by NTP, and explained today by Dr. Yiamouyiannis, are, as he notes, not surprising considering the vast amount of data that caused the animal study to be conducted in the first place. The results are not surprising to NFFE Local 2050 either. Four years ago we realized that the claim that there was no evidence that fluoride could cause genetic effects or cancer could not be supported by the shoddy document thrown together by the EPA contractor.

It was apparent to us that EPA bowed to political pressure without having done an in-depth, independent analysis, using in-house experts, of the currently existing data that show fluoride causes genetic effects, promotes the growth of cancerous tissue, and is likely to cause cancer in humans. If EPA had done so, it would have been readily apparent - as it was to Congress in 1977 - that there were serious reasons to believe in a cancer threat.

The behavior by EPA in this affair raises questions about the integrity of science at EPA and the role of professional scientists, lawyers and engineers who provide the interpretation of the available data and the judgments necessary to protect the public health and the environment. Are scientists at EPA there to arrange facts to fit preconceived conclusions? Does the Agency have a responsibility to develop world-class experts in the risks posed by chemicals we are exposed to every day, or is it permissible for EPA to cynically shop around for contractors who will provide them the 'correct' answers?"[147]

What were the NTP study results? Out of 130 male rats that ingested 45 to 79 ppm of fluoride, 5 developed osteosarcoma, a rare bone cancer. There were cases, in both males and females at those doses, of squamous cell carcinoma in the mouth.[148] Both rats and mice had dose-related fluorosis of the teeth, and female rats suffered osteosclerosis of the long bones.[149]

When Yiamouyiannis analyzed the same data, he found mice with a particularly rare form of liver cancer, known as hepatocholangiocarcinoma. This cancer is so rare, according to Yiamouyiannis, that the odds of its appearance in this study by chance are 1 in 2 million in male mice and 1 in 100,000 in female mice.[150] He also found precancerous changes in oral squamous cells, an increase in squamous cell tumors and cancers, and thyroid follicular cell tumors as a result of increasing levels of fluoride in drinking water.[151]

A March 13, 1990, New York Times article commented on the NTP findings:

"Previous animal tests suggesting that water fluoridation might pose risks to humans have been widely discounted as technically flawed, but the latest investigation carefully weeded out sources of experimental or statistical error, many scientists say, and cannot be discounted."[152]

In the same article, biologist Dr. Edward Groth notes: "The importance of this study...is that it is the first fluoride bioassay giving positive results in which the latest state-of-the-art procedures have been rigorously applied... It has to be taken seriously."[153]

On February 22, 1990, the Medical Tribune, an international medical news weekly received by 125,000 doctors, offered the opinion of a federal scientist who preferred to remain anonymous:

"It is difficult to see how EPA can fail to regulate fluoride as a carcinogen in light of what NTP has found. Osteosarcomas are an extremely unusual result in rat carcinogenicity tests. Toxicologists tell me that the only other substance that has produced this is radium....The fact that this is a highly atypical form of cancer implicates fluoride as the cause. Also, the osteosarcomas appeared to be dose-related, and did not occur in controls, making it a clean study."[154]

Public health officials were quick to assure a concerned public that there was nothing to worry about. The ADA said the occurrence of cancers in the lab may not be relevant to humans since the level of fluoridation in the experimental animals' water was so high. But the Federal Register, which is the handbook of government practices, disagrees: "The high exposure of experimental animals to toxic agents is a necessary and valid method of discovering possible carcinogenic hazards in man. To disavow the findings of this test would be to disavow those of all such tests, since they are all conducted according to this standard."[155]

As a February 5, 1990, Newsweek article pointed out, "such mega dosing is standard toxicological practice. It's the only way to detect an effect without using an impossibly large number of test animals to stand in for the humans exposed to the substance."[156] And as the Safer Water Foundation explains, higher doses are generally administered to test animals to compensate for the animals' shorter life span and because humans are generally more vulnerable than test animals on a body-weight basis.[157]

Several other studies link fluoride to genetic damage and cancer. An article in Mutation Research says that a study by Proctor and Gamble, the very company that makes Crest toothpaste, did research showing that 1 ppm fluoride causes genetic damage.[158] Results were never published but Proctor and Gamble called them "clean," meaning animals were supposedly free of malignant tumors. Not so, according to scientists who believe some of the changes observed in test animals could be interpreted as precancerous.[159] Yiamouyiannis says the Public Health Service sat on the data, which were finally released via a Freedom of Information Act request in 1989." Since they are biased, they have tried to cover up harmful effects," he says. "But the data speaks for itself. Half the amount of fluoride that is found in the New York City drinking water causes genetic damage."[160]

A National Institutes of Environmental Health Sciences publication, Environmental and Molecular Mutagenesis, also linked fluoride to genetic toxicity when it stated that "in cultured human and rodent cells, the weight of evidence leads to the conclusion that fluoride exposure results in increased chromosome aberrations."[161] The result of this is not only birth defects but the mutation of normal cells into cancer cells. The Journal of Carcinogenesis further states that "fluoride not only has the ability to transform normal cells into cancer cells but also to enhance the cancer-causing properties of other chemicals."[162]

Surprisingly, the PHS put out a report called "Review of fluoride: benefits and risks," in which they showed a substantially higher incidence of bone cancer in young men exposed to fluoridated

water compared to those who were not. The New Jersey Department of Health also found that the risk of bone cancer was about three times as high in fluoridated areas as in non-fluoridated areas.[163]

Despite cover-up attempts, the light of knowledge is filtering through to some enlightened scientists. Regarding animal test results, the director of the U.S. National Institute of Environmental Health Sciences, James Huff, does say that "the reason these animals got a few osteosarcomas was because they were given fluoride...Bone is the target organ for fluoride." [164] Toxicologist William Marcus adds that "fluoride is a carcinogen by any standard we use. I believe EPA should act immediately to protect the public, not just on the cancer data, but on the evidence of bone fractures, arthritis, mutagenicity, and other effects."[165]

One group working to illuminate the fluoride cover up is The Environmental Working Group (EWG) out of Washington-DC. In a letter referring to a 2005 Harvard University study, EWG's Sr. Vice President Richard Wiles requested that the National Toxicology Program declared fluoride in tap water a known or probable cancer cause.[166] Expressing a similar sentiment to British newspaper The Observer, Wiles stated "I've spent 20 years in public health trying to protect kids from toxic exposure. Even with DDT, you don't have the consistently strong data that the compound can cause cancer as you now have with fluoride".[167] The study that got the EWG talking became available in 2001 and clearly linked fluoride in tap water, at levels common in most of America, to a rare form of bone cancer called osteosarcoma.[168]

Paul Connett notes that "some of the earliest opponents of fluoride were biochemists and at least 14 Nobel Prize winners are among numerous scientists who have expressed their reservations about the practice of fluoridation."[169] He cites Dr, James Sumner, who won the Nobel Prize for his work on enzyme chemistry, who says, "We ought to go slowly. Everybody knows fluorine and fluoride are very poisonous substances...We use them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned; because the enzymes are poisoned and that is why animals and plants die."[170]

It is instructive to note that the fluoride compounds that are added to our drinking water are not pharmaceuticals. They are direct, unfiltered waste products of the aluminum and fertilizer industries.

Fluoride and Lead

Fluoride and its various compounds are toxic all by themselves, but its interaction with other toxic metals is of increasing concern. Research published in the December 2000 issue of the journal NeuroToxicology warns that public drinking water treated with sodium silicofluoride or fluosilicic acid, known silicofluorides (SiFs), is linked to higher uptake of lead in children.[171] Less than 10% of fluoridation systems in the US use sodium fluoride, the substance first used to fluoridate public drinking water in 1945. SiF's are now used to treat drinking water for 140 million Americans. Yet the safety of SiFs has never been tested, nor have they been approved by the FDA.

The research was conducted by a team led by Roger D. Masters, Dartmouth College Research Professor and Nelson A. Rockefeller Professor of Government Emeritus, and Myron J. Coplan, a consulting chemical engineer, formerly Vice President of Albany International Corporation. The team has now studied the blood lead levels in over 400,000 children in three different samples. In each case, they found a significant link between SiF-treated water and elevated blood lead levels. The researchers found that the greatest likelihood of children having elevated blood lead levels occurs when they are exposed both to known risk factors, such as old house paint and lead in soil or water, and to SiF-treated drinking water.[172]

> "Our research needs further laboratory testing," said Masters. "This should have the highest priority because our preliminary findings show correlations between SiF use and more behavior problems due to known effects of lead on brain chemistry." Also requiring further examination is German research that shows SiFs inhibit cholinesterase, an enzyme that plays an important role in regulating neurotransmitters.[173]
>
> "If SiFs are cholinesterase inhibitors, this means that SiFs have effects like the chemical agents linked to Gulf War Syndrome, chronic fatigue syndrome and other puzzling conditions that plague millions of Americans," said Masters. "We need a better understanding of how SiFs behave chemically and physiologically."[174]
>
> "We should stop using silicofluorides in our public water supply until we know what they do," says Masters.[175]

Fluoride and Aluminum

Lead isn't the only metal that interacts with fluoride in a toxic combination. Aluminum is another.

In 1976, Dr. D. Allman and coworkers from Indiana University School of Medicine fed animals 1 part-per-million (ppm) fluoride and found that in the presence of aluminum, in a concentration as small as 20 parts per billion, fluoride is able to cause an even larger increase in cyclic AMP levels. Cyclic AMP inhibits the migration rate of white blood cells, as well as the ability of the white blood cell to destroy pathogenic (disease-causing) organisms. The fact that fluoride toothpastes and school based mouth rinses are packaged in aluminum accentuates the effect on the body.[176]

Research conducted by Mullenix and colleagues in 1995 indicated that rats treated with low doses of fluoride cause sex- and dose-specific behavioral aberrations with a common pattern.[177] Prenatal rats exposed became hyperactive, while those exposed post-natal became hypoactive. This effect was confirmed by a 2001 study in which administration of sodium fluoride with drinking water produced both behavioral and dental toxicities. A suppression of spontaneous motor activity, a shortening of Rota-rod endurance time, a decreased body weight gain and food intake, a suppression of total cholinesterase and acetyl cholinesterase activities and dental lesion were observed in test animals. Serum fluoride concentration was raised markedly and that of calcium was decreased in the animals.[178]

A 1998 study by Julie A. Varner and colleagues at the Psychology Department of Binghamton University (NY) shows that neurotoxic effects like these are enhanced by the synergetic action of fluoride and aluminum.[179] Varner describes "alterations in the nervous system resulting from chronic administration of the fluoroaluminum complex or equivalent levels of fluoride in the form of sodium-fluoride. The rats were given fluoride in drinking water at the same level deemed "optimal" by pro-fluoridation groups, namely 1 part per million (1 ppm). Most pronounced damage was seen in animals that got the fluoride in conjunction with aluminum. The pathological changes found in the brain tissue of the animals were similar to the alterations found in the brains of people with Alzheimer's disease and dementia. The authors speculate that fluoride enables aluminum to cross the blood-brain barrier. These results are especially disturbing because of the low dose level of fluoride that shows the toxic effect in rats - rats are more resistant to fluoride than humans."[180]

Another study done in Czechoslovakia adds force to the idea that aluminum may act synergistically with fluoride to trigger the mechanisms of Alzheimer's disease. The study shows that some of pathologic changes associated with AD are not induced by aluminum alone, but by the aluminofluoride complexes. These complexes may act as the initial signal stimulating impairment of homeostasis, degeneration and death of the cells. By influencing energy metabolism these complexes can accelerate the aging and impair the functions of the nervous system. "In respect to the etiology of AD, the long term action of aluminofluoride complexes may represent a serious and powerful risk factor for the development of AD," the authors conclude.[181]

Those who are under the belief that fluoride would rarely interact with aluminum have been misled. Fluoride is, in fact, a direct byproduct of aluminum production. Aluminum is often added to drinking water as a flocculating agent, by the same local water authorities who oversee the fluoridation of water. Aluminum and fluoride form a number of complexes, the most deadly of these being aluminum tetra fluoride.[182] Czech researchers have shown that the body reacts to aluminum tetra fluoride as if it were a phosphate ion capable of triggering G proteins. G-proteins are water-soluble substances (i.e. hormones, neurotransmitters, and growth factors) that transmit messages from the outside to the inside of a cell.[183] Aluminum tetra-fluoride is capable of switching on G proteins without hormones, neurotransmitters, or growth factors present.[184] 'This, notes Paul Connett, 'is the most worrisome aspect of fluoride subtle biochemistry."[185]

Fluoride and the Pineal Gland

Another concern is fluoride's effect on the pineal gland, a small but powerful structure located between the right and left hemispheres of the brain. The pineal gland secretes melatonin, a hormone that affects such functions as sleep cycles, jet lag, hibernation in animals, immunity, and the onset of puberty. Jennifer Luke, Ph.D., found that the pineal gland attracts fluoride, and, thereby, interferes with melatonin's functions.[186] In autopsy studies she discovered extremely high concentrations of fluoride in the gland, averaging 9,000 ppm, and going up to 21,000 ppm in some cases.[187] And in an accompanying study of fluoride-treated Mongolian gerbils (the animal considered most favorable for studying effects on the pineal gland) Luke found lower levels of melatonin and earlier onset of puberty.

This research is highly suggestive. People with insomnia could be suffering as a result of fluoride's interference with melatonin production. Currently more than half the population of the United States suffers from some form of sleep disturbance.[188] Sleep deprivation promotes reduced immunity. Sleep-challenged people are more likely to suffer depression, stroke, or heart disease than their well-rested peers. Numerous studies have correlated insufficient melatonin production with an earlier-than-usual onset of puberty.[189, 190]

This recalls the 1955 Newburgh-Kingston study, which produced some extremely puzzling results that scientists have yet to explain. One was the finding that girls in fluoridated Newberg were reaching menstruation five months earlier on average than the girls in un-fluoridated Kingston. This raises the question; does fluoride contribute to the alarming rates of early puberty that we are seeing?[191] Premature menstruation is associated with a variety of ills, including breast cancer and obesity. A 2001 study published in the American Journal of Public Health reveals that early maturation nearly doubled the odds of being obese.[192]

Reproductive Effects

Fluoride has long been known to undermine fertility in animals and man.[193] In 1951 commercial chinchilla breeder named W.R. Cox reported reproductive anomalies in commercially raised chinchillas fed with a high-fluoride animal feed.[194] When Cox changed to a low-fluoride feed, "there were increases in the number of offspring born; the number of litters, and the numbers born alive. The adult mortality rate decreased from 14.6% in 1951 to 3.3% in 1952. A number of abnormalities associated with fluoride-contaminated feed were passed on through multiple generations."[195]

Cox, a layman, studied the scientific literature, and found more than 1400 studies indicating fluoride's adverse effect on animals, especially soft tissue damage. Cox was surprised to find that the scientists advocating public water fluoridation at the time showed no interest in these studies or their possible implications for human health.[196]

SC Freni participated in a 1991 USPHS review of the toxicity of fluoride. Searching for studies that correlated fluoride exposure with reproductive effects in humans, he discovered that in almost 50 years of fluoridation, no one had ever study fluoride's effect on the human fetus.[197]

Freni's 1994 review of fluoride toxicity the National Center for Toxicological Research showed decreased fertility in most animal species studied. Freni then investigated whether fluoride would also affect human birth rates. He studied counties in which the water had a fluoride content of more than 3 ppm. Most regions he studied showed an association of decreasing total fertility rates (TFR) with increasing fluoride levels. There was no evidence that this outcome resulted from selection bias, inaccurate data, or improper analytical methods.[198] Freni speculated that fluoride might lower protein synthesis in osteoblasts or that it inhibits the adenylyl cyclase system in human spermatozoa.[199]

In a 1994 study of mature rats treated with sodium fluoride, Narayana and Chinoy[200] found that fluoride interferes with androgenesis and damaged the testes by inhibiting the action of testosterone. Another study by the same team studied human spermatozoa treated with 25, 50,

and 250 mm of fluoride for 5, 10, and 20 minutes. Silver nitrate staining of fluoride-treated sperm revealed elongated heads, de-flagellation, and loss of the acrosome together with coiling of the tail. Sperm glutathione levels also showed a time-dependent decrease with complete depletion after 20 minutes, indicating rapid glutathione oxidation in detoxification of the NaF. The altered lysosomal enzyme activity and glutathione levels together with morphologic anomalies resulted in a significant decline in sperm motility with an effective dose of 250 mm.[201]

Fluoride and Intelligence

Several other studies link fluoride exposure to adverse effects on intelligence.

As far back as April 1944, as part of the secret Manhattan Project, there was a memo passed around stating, "Clinical evidence suggests that C616 [uranium hydrofluoride] may have a rather marked central nervous system effect with mental confusion, drowsiness and lassitude."[202] Through the following decades, numerous scientific studies determined the same thing: Fluorosis affects the nervous system and membrane lipids.

One investigation conducted in China measured the intelligence of children aged 8 to 13 with non, slight, medium, and serious fluorosis. It demonstrated a 15-19 point decrease in IQ among children in the fluorosis area as compared with the non-fluorosis area.[203] Another study of children's intelligence and the metabolism of iodine and fluorine, also in China, revealed that exposure to high levels of fluoride produced increased prevalence of thyroid enlargement (29.8%) and dental fluorosis (72.9%), and a slightly lower average IQ as compared to control areas. The IQ differential was more pronounced (16.8%) when lower intelligence children were studied separately.[204] Paul Connett cites a recent review by the Greater Boston Physicians for Social Responsibility which found that fluoride interferes with brain function in young animals and children.[205]

Enzyme Toxicity and Genetic Damage

Fluoride is a potent enzyme poison. Enzymes are special types of proteins, known as catalysts, which trigger thousands of chemical reactions in the body. Enzymes are vital to our very existence, writes Dr. Anthony Cichoke: 'During every moment of our lives, enzymes keep us going. At this very instant, millions of tiny enzymes are working throughout your body causing reactions to take place. You couldn't breathe, hold or turn the pages of this book, read its words, eat a meal, taste the food, or hear a telephone ring without enzymes. Even minute doses of 1 ppm of fluoride could prevent essential biological reactions from taking place."[206]

While the mechanisms of enzyme destruction were not well understood in the 1940's and 50's, scientists now believe that it could be due to fluoride's interference with magnesium, a vital cofactor needed by many enzymes to perform catalytic functions. Another reason could be fluoride's ability to form strong bonds with hydrogen. Hydrogen, a strongly positive element, binds easily with the strong negatively-charged fluoride. Dr. Paul Connett explains: "Hydrogen bonding is at the very heart and soul of biochemistry. Protein structure and function revolve around hydrogen bonds. Hydrogen gives shape, and that shape can be easily manipulated with little energy. Enzymes usually catalyze around hydrogen bonds. In addition, the two strands of

DNA are held together with hydrogen bonds. So, you're striking at the very heart of biology. It's a huge red flag to be extremely careful about introducing fluoride to any living system."[207]

While critics argue that only high doses cause such effects, studies suggest that even a supposedly "safe" concentration of 1 ppm of fluoride added to drinking water is able to interfere with critical biological functions. This was demonstrated in 1977 at Austria's Siebersdorf Research Center by Dr. W. Klein and colleagues, who found that even this low dose inhibited DNA repair enzyme activity by 50 percent and caused genetic and chromosome damage.[208] A similar study conducted at the University of Missouri confirmed these results.[209] Scientists at Poland's Pomeranian Medical Academy found that as little as 0.6 ppm of fluoride produced chromosomal damage to human white blood cells.[210] And most recently, in January of 2008, after 3 years of investigating hundreds of studies, an NRC expert panel "concluded that fluoride can subtly alter endocrine function, especially in the thyroid – the gland that produces hormones regulation growth and metabolism".[211]

Sperm cells displayed "a highly significant increase in mutation" after being treated with fluoride at Holland's Leiden University.[212] And studies at Germany's Central Laboratory for Mutagenicity Testing[213] and by Drs. Yiamouyannis and Burk at Columbia University[214] showed that it also caused genetic damage to eggs in both insects and laboratory animals.

The Challenge of Eliminating Fluoride

Given all the scientific challenges to the idea of the safety of fluoride, why does it remain a protected contaminant? As Susan Pare of the Center for Health Action asks, "...even if fluoride in the water did reduce tooth decay, which it does not, how can the EPA allow a substance more toxic than Alar, red dye #3, and vinyl chloride to be injected purposely into drinking water?"[215]

This is certainly a logical question and, with all the significant, solid science that exists on the subject, you would think that there would be a great deal of interest in getting fluoride out of our water supply. Unfortunately, that hasn't been the case. As Dr. William Marcus, a senior science advisor in the EPA's Office of Drinking Water, has found, the top governmental priority has been to sweep the facts under the rug and, if need be, to suppress truth-tellers. Marcus explains that fluoride is one of the chemicals the EPA specifically regulates, and that he was following the data coming in on fluoride very carefully when a determination was going to be made on whether the levels should be changed. He discovered that the data were not being heeded. But that was only the beginning of the story for him. Marcus recounts what happened:

> "The studies that were done by Botel Northwest showed that there was an increased level of bone cancer and other types of cancer in animals....in that same study, there were very rare liver cancers, according to the board-certified veterinary pathologists at the contractor, Botel. Those really were very upsetting because they were hepatocholangeal carcinomas, very rare liver cancers....Then there were several other kinds of cancers that were found in the jaw and other places.

I felt at that time that the reports were alarming. They showed that the levels of fluoride that can cause cancers in animals are actually lower than those levels ingested in people (who take lower amounts but for longer periods of time).

I went to a meeting that was held in Research Triangle Park, in April 1990, in which the National Toxicology Program was presenting their review of the study. I went with several colleagues of mine, one of whom was a board-certified veterinary pathologist who originally reported hepatocholangeal carcinoma as a separate entity in rats and mice. I asked him if he would look at the slides to see if that really was a tumor or if the pathologists at Botel had made an error. He told me after looking at the slides that, in fact, it was correct.

At the meeting, every one of the cancers reported by the contractor had been downgraded by the National Toxicology Program. I have been in the toxicology business looking at studies of this nature for nearly 25 years and I have never before seen every single cancer endpoint downgraded.... I found that very suspicious and went to see an investigator in the Congress at the suggestion of my friend, Bob Carton. This gentleman and his staff investigated very thoroughly and found out that the scientists at the National Toxicology Program down at Research Triangle Park had been coerced by their superiors to change their findings."[216]

Once Dr. Marcus acted on his findings, something ominous started to happen in his life:

"...I wrote an internal memorandum and gave it to my supervisors. I waited for a month without hearing anything. Usually, you get a feedback in a week or so. I wrote another memorandum to a person who was my second-line supervisor explaining that if there was even a slight chance of increased cancer in the general population, since 140 million people were potentially ingesting this material that the deaths could be in the many thousands. Then I gave a copy of the memorandum to the Fluoride Work Group, who waited some time and then released it to the press.

Once it got into the press all sorts of things started happening at EPA -- I was getting disciplinary threats, being isolated, and all kinds of things which ultimately resulted in them firing me on March 15, 1992."[217]

In order to be reinstated at work, Dr. Marcus took his case to court. In the process, he learned that the government had engaged in various illegal activities, including 70 felony counts, in order to get him fired. At the same time, those who committed perjury were not held accountable for it. In fact, they were rewarded for their efforts:

When we finally got the EPA to the courtroom...they admitted to doing several things to get me fired. We had notes of a meeting...that showed that fluoride was one of the main topics discussed and that it was agreed that they would fire me with the help of the Inspector General. When we got them on the stand and showed them the memoranda, they finally remembered and said, oh yes, we lied about that in our previous statements.

> Then...they admitted to shredding more than 70 documents that they had in hand - Freedom of Information requests. That's a felony.... In addition, they charged me with stealing time from the government. They...tried to show...that I had been doing private work on government time and getting paid for it. When we came to court, I was able to show that the time cards they produced were forged, and forged by the Inspector General's staff...."[218]

For all his efforts, Dr. Marcus was rehired, but nothing else has changed: "The EPA was ordered to rehire me, which they did. They were given a whole series of requirements to be met, such as paying me my back pay, restoring my leave, privileges, and sick leave and annual leave. The only thing they've done is put me back to work. They haven't given me any of those things that they were required to do."[219]

What is at the core of such ruthless tactics? John Yiamouyiannis feels that the central concern of government is to protect industry, and that the motivating force behind fluoride use is the need of certain businesses to dump their toxic waste products somewhere. They try to be inconspicuous in the disposal process and not make waves. "As is normal, the solution to pollution is dilution. You poison everyone a little bit rather than poison a few people a lot. This way, people don't know what's going on."[220] Since the Public Health Service has promoted the fluoride myth for over 50 years, they're concerned about protecting their reputation. So scientists like Dr. Marcus, who know about the dangers, are intimidated into keeping silent. Otherwise, they jeopardize their careers.

Dr. John Lee elaborates: "Back in 1943, the PHS staked their professional careers on the benefits and safety of fluoride. It has since become bureaucratized. Any public health official who criticizes fluoride, or even hints that perhaps it was an unwise decision, is at risk of losing his career entirely. This has happened time and time again. Public health officials such as Dr. Gray in British Columbia and Dr. Colquhoun in New Zealand found no benefit from fluoridation. When they reported these results, they immediately lost their careers.... This is what happens - the public health officials who speak out against fluoride are at great risk of losing their careers on the spot."[221]

Yiamouyiannis adds that for the authorities to admit that they're wrong would be devastating. "It would show that their reputations really don't mean that much.... They don't have the scientific background. As Ralph Nader once said, if they admit they're wrong on fluoridation, people would ask, and legitimately so, what else have they not told us right?"[222]

Accompanying a loss in status would be a tremendous loss in revenue. Yiamouyiannis points out that "the indiscriminate careless handling of fluoride has a lot of companies, such as Exxon, U.S. Steel, and Alcoa, making tens of billions of dollars in extra profits at our expense.... For them to go ahead now and admit that this is bad, this presents a problem, a threat, would mean tens of billions of dollars in lost profit because they would have to handle fluoride properly. Fluoride is present in everything from phosphate fertilizers to cracking agents for the petroleum industry."[223]

Fluoride could only be legally disposed of at a great cost to industry. As Dr. Bill Marcus explains, "There are prescribed methods for disposal and they're very expensive. Fluoride is a very potent poison. It's a registered pesticide, used for killing rats or mice.... If it were to be disposed of, it would require a class-one landfill. That would cost the people who are producing aluminum or fertilizer about $7000+ per 5000- to 6000-gallon truckload to dispose of it. It's highly corrosive."[224]

Another problem is that the U.S. judicial system, even when convinced of the dangers, is powerless to change policy. Yiamouyiannis tells of his involvement in court cases in Pennsylvania and Texas in which, while the judges were convinced that fluoride was a health hazard, they did not have the jurisdiction to grant relief from fluoridation. That would have to be done, it was ultimately found, through the legislative process.[225]

Dr. Hirzy, vice president of the union that represents the scientists who work for the EPA, cites three landmark cases in which judges with "no interest except in the finding of fact and administering justice"[226] ruled against fluoridation. In November, 1978, Judge John Flaherty, now Chief Justice of the Supreme Court of Pennsylvania, issued findings in the case, Aitkenhead v. Borough of West View, tried before him in the Allegheny Court of Common Pleas.

He summarized his findings as follows.

"In my view, the evidence is quite convincing that the addition of sodium fluoride to the public water supply at one part per million is extremely deleterious to the human body, and, a review of the evidence will disclose that there was no convincing evidence to the contrary..."[227]

"Prior to hearing this case, I gave the matter of fluoridation little, if any, thought, but I received quite an education, and noted that the proponents of fluoridation do nothing more than try to impugn the objectivity of those who oppose fluoridation."[228]

In an Illinois decision, Judge Ronald Niemann concludes: "This record is barren of any credible and reputable scientific epidemiological studies and or analysis of statistical data which would support the Illinois Legislature's determination that fluoridation of the water supplies is both a safe and effective means of promoting public health."[229]

Judge Anthony Farris in Texas found: "[That] the artificial fluoridation of public water supplies, such as contemplated by {Houston} City ordinance No. 80-2530 may cause or contribute to the cause of cancer, genetic damage, intolerant reactions, and chronic toxicity, including dental mottling, in man; that the said artificial fluoridation may aggravate malnutrition and existing illness in man; and that the value of said artificial fluoridation is in some doubt as to reduction of tooth decay in man."

Dr. Hirzy, himself a toxicologist and an expert in environmental management and risk assessment, comments: "The significance of Judge Flaherty's statement and his and the other two judges' findings of fact is this: proponents of fluoridation are fond of reciting endorsement statements by authorities, such as those by CDC and the American Dental Association, both of which have long-standing commitments that are hard if not impossible to recant, on the safety

and efficacy of fluoridation. Now come three truly independent servants of justice, the judges in these three cases, and they find that fluoridation of water supplies is not justified."[230]

Interestingly, the judiciary seems to have more power to effect change in other countries. Yiamouyiannis states that when he presented the same technical evidence in Scotland, the Scottish court outlawed fluoridation based on the evidence.[231]

Indeed, most of Western Europe has rejected fluoridation on the grounds that it is unsafe. In 1971, after 11 years of testing, Sweden's Nobel Medical Institute recommended against fluoridation, and the process was banned. The Netherlands outlawed the practice in 1976, after 23 years of tests. France decided against it after consulting with its Pasteur Institute[232] and Germany rejected the practice because the recommended dosage of 1 ppm was "too close to the dose at which long-term damage to the human body is to be expected."[233] Dr. Lee sums it up: "All of western Europe, except one or two test towns in Spain, has abandoned fluoride as a public health plan. It is not put in the water anywhere. They all established test cities and found that the benefits did not occur and the toxicity was evident."[234]

But Europe is not the sole bastion of sanity in the fluoridation arena. Several municipalities in the United States have taken an enlightened stance on the issue. In 1997, the Natick (MA) Fluoridation Study Committee submitted a comprehensive report to the Town and the Board of Selectmen, overwhelming recommending rejection of fluoridation of the town's water. The committee consisted of scientists, academics, and citizens of the town of Natick. The committee summarized its findings as follows:

- Recent studies of the incidence of cavities in children show little to no difference between fluoridated and non-fluoridated communities.
- Ten to thirty percent (10-30%) of Natick's children will have very mild to mild dental fluorosis if Natick fluoridates its water (up from probably 6% now).Approximately 1% of Natick's children will have moderate or severe dental fluorosis. Dental fluorosis can cause great concern for the affected family and may result in additional dental bills. It should not be dismissed as a "cosmetic" effect.
- Fluoride adversely affects the central nervous system, causing behavioral changes and cognitive deficits. These effects are observed at fluoride doses that some people in the US actually receive.
- There is good evidence that fluoride is a developmental neurotoxicant, meaning that fluoride affects the nervous system of the developing fetus at doses that are not toxic to the mother. The developmental neurotoxicity would be manifest as lower IQ and behavioral changes.
- Water fluoridation shows a positive correlation with increased hip fracture rates in persons 65 years of age and older, based on two recent epidemiology studies.
- Some adults are hypersensitive to even small quantities of fluoride, including that contained in fluoridated water. At least one such person is a Natick resident.
- The impact of fluoride on human reproduction at the levels received from environmental exposures is a serious concern. A recent epidemiology study shows a correlation between decreasing annual fertility rate in humans and increasing levels of fluoride in drinking water.

- Animal bioassays suggest that fluoride is a carcinogen, especially for tissues such as bone (osteosarcoma) and liver. The potential for carcinogenicity is supported by fluoride's genotoxicity and pharmacokinetic properties. Human epidemiology studies to date are inconclusive, but no appropriate major study has been conducted.
- Fluoride inhibits or otherwise alters the actions of a long list of enzymes important to metabolism, growth, and cell regulation.
- Sodium fluorosilicate and fluorosilicic acid, the two chemicals Natick intends to use to fluoridate the water supply, have been associated with increased concentrations of lead in tap water and increased blood lead levels in children, based on case reports and a new, as-yet-unpublished study.
- If Natick fluoridates its water supply at the proposed level, most children under the age of three will daily receive more fluoride than is recommended for them.

The scientific literature supporting these findings is summarized in the full report which also discusses a variety of non-health related concerns that have been raised about water fluoridation.

The Committee reached the firm conclusion that the risks of overexposure to fluoride far outweigh any current benefit of water fluoridation.

Their Recommendations:

1. The Natick Fluoridation Study Committee unanimously and emphatically recommends that the town of Natick NOT fluoridate the town water supply.

2. The Natick Fluoridation Study Committee unanimously and emphatically recommends that the Board of Selectmen take appropriate action to ensure that fluoridation of the town water supply does not take place.[235]

Conclusion

Natick is not an isolated case. The town of Bishopville, SC recently voted to discontinue fluoridation. Eureka Springs, Arkansas decided not to begin a proposed fluoridation program. "The citizens of Eureka Springs don't want to be medicated against their will," Mayor Beau Satori said. "They just want fine-tasting water."[236] In fact, the Fluoride Action Network list over 100 municipalities in the US and Canada that have rejected or discontinued fluoride since 1990.[237]

Isn't it time the United States as a whole followed this example? While the answer is obvious, it is also apparent that government policy is unlikely to change without public support. We therefore must communicate with legislators, and insist on one of our most precious resources - pure, unadulterated drinking water. Yiamouyiannis urges all American people to do so. He emphasizes the immediacy of the problem:

> "There is no question with regard to fluoridation of public water supplies. It is absolutely unsafe...and should be stopped immediately. This is causing more destruction to human health than any other single substance added purposely or inadvertently to the water

> supply. We're talking about 35,000 excess deaths a year...10,000 cancer deaths a year...130 million people who are being chronically poisoned. We're not talking about dropping dead after drinking a glass of fluoridated water.... It takes its toll on human health and life, glass after glass."[238]

Dr. Hirzy points to the absurdity of government policy on fluoride. The phosphate fertilizer industry captures hydrofluosilicic acid and uses what would otherwise be an air or water pollutant as a low-cost source of fluoride for water authorities. 'If this material comes out of a smoke stack it's an air pollutant; if it goes out the drain pipe into the river it's a water pollutant. But it is magically converted into some sort of beneficial agent when put in a tank wagon and bled into the drinking water. It's a remarkable transformation."[239]

There is a major moral issue in the fluoridation debate that has largely escaped notice. The first is that, as columnist James Kilpatrick observes, it is "the right of each person to control the drugs he or she takes." Kilpatrick calls fluoridation compulsory mass medication, a procedure that violates the principles of medical ethics.[240] A New York Times editorial agrees:

> "In light of the uncertainty, critics [of fluoridation] argue that administrative bodies are unjustified in imposing fluoridation on communities without obtaining public consent.... The real issue here is not just the scientific debate. The question is whether any establishment has the right to decide that benefits outweigh risks and impose involuntary medication on an entire population. In the case of fluoridation, the dental establishment has made opposition to fluoridation seem intellectually disreputable. Some people regard that as tyranny."[241]

The time to act is now. We have a responsibility to stand up against political influence and corruption, and do what is really best for us, our health, and the planet. The issue is no longer whether there is adequate science to make us question fluoride's safety. There is more than enough scientific evidence to support a total ban on fluoride. But industry and the our legislative bodies that are dominated by special interest groups may never get around to admitting the obvious danger, unless we demand it.

The official stance on the fluoride issue reflects a consistent pattern of denial that begins in the earliest years of the twentieth century, with industry's initial support and encouragement for water fluoridation and continues to this day with propaganda campaigns, scientific disinformation, and out and out attacks on those who have attempted to let the truth be known.

We must speak out now, and let our leaders know that we want the truth to come out. If not for us, for future generations to have the choice, the option, the opportunity (after all, are we not a country that rallies behind freedom?) to drink water -- the liquid of life -- without risking their vitality.

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[218] Ibid.
[219] Ibid.
[220] Gary Null interview with Dr. John Yiamouyiannis, 3/10/95.
[221] Gary Null interview with Dr. John Lee, 3/10/95.
[222] Gary Null interview with Dr. John Yiamouyiannis, 3/10/95.
[223] Ibid.
[224] Gary Null interview with Dr. William Marcus, 3/10/95.
[225] Gary Null interview with Dr. John Yiamouyiannis, 3/10/95.
[226] Hirzy. Op. cit.
[227] Ibid.
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[229] Ibid.
[230] Ibid.
[231] Gary Null interview with Dr. John Yiamouyiannis, 3/10/95.
[232] New York State Coalition Opposed to Fluoridation.
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[234] Gary Null interview with Dr. John Lee, 3/10/95.
[235] Should Natick Fluoridate? A Report to the Town and the Board of Selectmen Prepared by the Natick Fluoridation Study Committee 13 E. Central Street, Town of Natick, MA October 23, 1997
[236] Arkansas Democrat-Gazette, June 13, 2001.
[237] http://www.fluoridealert.org
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[239] Ibid.
[240] The Morning Call, 2/7/90
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-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of schweitzer@youmano.com
Sent: Wednesday, February 22, 2012 5:18 PM
To: Peter Dance
Subject: Budget Figures For Fluoridation

Hello, Peter, would you, please, send me the budget figures for fluoridation - cost of equipment to implement, cost of maintenance of the equipment, cost of any changes to existing systems/structures to implement, cost of fluoride/year, cost of storage (both fluoride and the facility to house it), incremental cost to outfit and protect workers and to hire additional staff? Also, would you, please, send me the exact chemical name of the fluoride you intend to use (the one used in the budget figures), whether is is pharmaceutical or industrial grade, and tell me from what country(s) and company(s)it would be sourced (per budget figures)? Thank you, Peter. Susan Schweitzer P.S. I wanted to thank you for attending Dr. Connett's presentation. I don't know what you look like. I was hoping to meet you and Jason. Perhaps another time.
705-329-4908
41A Albany Ave.
Orillia, Ontario
L3V 2T5
I put in all of my information, per the website system request, but I would prefer an email response. Also, I would appreciate receiving this information by Monday, Feb 27th, 2012, at the latest. Thank you.

From: Tony Bridgens [mailto:tonybridgens@sympatico.ca]
Sent: Thursday, February 23, 2012 4:42 PM
To: Janet Nyhof
Subject: Fluoridation.

I would like the City of Orillia to fluoridate the water supply in order to preserve the dental health of the population. The water is already chlorinated for health reasons and table salt is iodized for the same reason. Fluorine, chlorine, bromine, and iodine are the halide elements and necessary for our well-being. I also not that our water is naturally hard which gives protection against up-take of lead from older plumbing, which used to contain lead. Softened water on the other hand dissolves lead and is not desirable for this reason. We need calcium and magnesium, which compose the hardness of the water, but it should be noted that the calcium content of the hard Orillia water does affect the concentration of fluoride needed for efficacy. Thus we will need a different concentration of fluoride than our neighbours to the north who draw acid water, low in calcium, from the granite of the Canadian Shield.

Best regards

Tony Bridgens
Tony Bridgens of Betty and Tony's

Betty and Tony's Waterfront B&B
677 Broadview Avenue
Orillia, ONTARIO
Canada L3V 6P1
001 705 326 1125
1 800 308 2579
http://www.BandBOrillia.com
p.s. For your convenience here is a link for reserving at the B&B on-line (no obligation or fee)
https://www.nbmain.com/nbAvailability.jsp?innkey=bnton&backpage=http://www.bandborillia.com&s=newsite

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Dr. Louise Hill
[redacted]

February 8, 2012

Dear Mayor Orsi and Council,

As a dentist in Orillia, I support the fluoridation of the city's water supply. I believe that it is exceedingly important for City Council to consider this safe and effective means of improving the dental health of Orillia's residents.

It has long been the view of the Ontario Dental Association, the Canadian Dental Association, and Dental Faculties that water fluoridation is a low-cost, safe way to prevent dental cavities in children and adults. Improvement in dental health has huge ramifications for children, including improving general health, ability to eat, ability to do well in school, and improvement in self-esteem.

It is important to note that Orillia's tooth decay rates are higher than those of other communities in our area, and especially compared with those that have fluoridation, such as Muskoka's towns and Tottenham.

Because dental decay is such a prevalent finding, the most common chronic disease among all ages in Canada, it would be laudable to be at the forefront to commit to preventing such a rampant problem, especially for those families with economic challenges.

I fully support a positive vote by Council that would bring fluoridation to the City of Orillia's municipal water supply,

Sincerely,

Louise Hill, DDS

February 22, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5

Dear Mayor Orsi and Council,
Re: Public consultations into community water fluoridation

As a Dentist with over 40 years experience, I am pleased to learn of the proposal to bring community water fluoridation to the city and would like to offer my support to the approval and implementation of this plan.

For the first 40 years of my dentistry career, I practiced in metropolitan Toronto; a city which has had fluoridated water since the early 1960's. For the past three years I have practiced in the City of Orillia and I can report that I have had to extract more teeth due to advanced tooth decay, from young people, in three years in Orillia than in 40 years in Toronto.

Throughout my years of dental practice, I have seen on a daily basis the detrimental effects that tooth decay can have on oral and overall health. Tooth decay can lead to many issues such as difficulty with eating, increased pain, trouble concentrating and decreased self-esteem and social skills.

Fluoridated water reaches all members of a community, regardless of age, financial status, or level of education. Water fluoridation reduces tooth decay by 20-40%. Systematic scientific reviews have shown no health concerns with optimally fluoridated water. It has been shown that people in areas with less than optimal levels of fluoride in drinking water regularly show poorer dental health than in comparable areas where it has been in use.

Community water fluoridation is also endorsed by organizations such a Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association as a proven safe and effective method of preventing tooth decay for the population.

As a professional who sees on a daily basis the detrimental effects of tooth decay, I encourage council to implement community water fluoridation.

Sincerely,

Dr. Jerry Lazar
[redacted]

February 13, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
clerks@orillia.ca

Dear Mayor Orsi and Council,
Re: Public consultations into community water fluoridation

As a practicing Registered Dental Hygienist, I am pleased to learn of the proposal to bring community water fluoridation to the city and would like to offer my support to the approval and implementation of this plan.

Working within a dental practice, I see on a daily basis the detrimental effects that tooth decay can have on oral and overall health. Tooth decay can lead to many issues such as difficulty with eating, increased pain, trouble concentrating and decreased self-esteem and social skills.

Fluoridated water reaches all members of a community, regardless of age, financial status, or level of education. Unfortunately, proper regular dental care is not affordable to all. Water fluoridation reduces tooth decay by 20-40%. Systematic scientific reviews have shown no health concerns with optimally fluoridated water.

Community water fluoridation is also endorsed by organizations such a Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association as a proven safe and effective method of preventing tooth decay for the population.

As a professional who sees on a daily basis the detrimental effects of tooth decay, I encourage council to implement community water fluoridation.

Sincerely,

H. Dominelli RDH

H. Dominelli

[redacted]

February 13, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
clerks@orillia.ca

Dear Mayor Orsi and Council,
Re: Public consultations into community water fluoridation

As a practicing Registered Dental Hygienist, I am pleased to learn of the proposal to bring community water fluoridation to the city and would like to offer my support to the approval and implementation of this plan.

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Community water fluoridation is also endorsed by organizations such a Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association as a proven safe and effective method of preventing tooth decay for the population.

As a professional who sees on a daily basis the detrimental effects of tooth decay, I encourage council to implement community water fluoridation.

Sincerely,

Erin L. Simpson, RDH.

(Erin L. Simpson)

[redacted]

February 13, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
clerks@orillia.ca

Dear Mayor Orsi and Council,
Re: Public consultations into community water fluoridation

As a practicing Registered Dental Hygienist, I am pleased to learn of the proposal to bring community water fluoridation to the city and would like to offer my support to the approval and implementation of this plan.

Working within a dental practice, I see on a daily basis the detrimental effects that tooth decay can have on oral and overall health. Tooth decay can lead to many issues such as difficulty with eating, increased pain, trouble concentrating and decreased self-esteem and social skills.

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Community water fluoridation is also endorsed by organizations such a Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association as a proven safe and effective method of preventing tooth decay for the population.

As a professional who sees on a daily basis the detrimental effects of tooth decay, I encourage council to implement community water fluoridation.

Sincerely,

SUZANNE SIMMONS RDH.

[redacted]

February 13, 2012

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
clerks@orillia.ca

Dear Mayor Orsi and Council,
Re: Public consultations into community water fluoridation

As a practicing Registered Dental Hygienist, I am pleased to learn of the proposal to bring community water fluoridation to the city and would like to offer my support to the approval and implementation of this plan.

Working within a dental practice, I see on a daily basis the detrimental effects that tooth decay can have on oral and overall health. Tooth decay can lead to many issues such as difficulty with eating, increased pain, trouble concentrating and decreased self-esteem and social skills.

Fluoridated water reaches all members of a community, regardless of age, financial status, or level of education. Unfortunately, proper regular dental care is not affordable to all. Water fluoridation reduces tooth decay by 20-40%. Systematic scientific reviews have shown no health concerns with optimally fluoridated water.

Community water fluoridation is also endorsed by organizations such a Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association as a proven safe and effective method of preventing tooth decay for the population.

As a professional who sees on a daily basis the detrimental effects of tooth decay, I encourage council to implement community water fluoridation.

Sincerely,

Kathy Holmes RDH

[redacted]

Muskoka-Simcoe Dental Society
Dr. Peter Dean, President

February 15, 2012

Dear Mayor Orsi and Council,

The Muskoka-Simcoe Dental Society, a component society of the Ontario Dental Association, is very pleased to learn of the proposal to bring community water fluoridation to the city, and offers its full support to the approval and implementation of this plan.

As dentists in Orillia and the surrounding area, we work daily with patients who face physical, mental and economic challenges, knowing that their conditions create substantial barriers against maintaining good health. For many of them, dental care is beyond their financial means. Their poor dental health can spiral into further serious physical and mental health conditions.

Data from the Simcoe Muskoka District Health Unit can attest to the fact that Orillia's tooth decay rates are higher than those of other communities in our area, and especially compared with those that have fluoridation, such as Muskoka's towns and Tottenham.

Adding an effective and safe level of fluoride to Orillia's municipal water supply would amount to a few tenths of a percentage of the city's total budget (approximately $1 per person per year). More importantly, it would provide an accessible means of protecting the oral health of the entire Orillia population, including the most vulnerable members of our community. The impact of this measure would have legacy benefits extending well beyond the term of this City Council. Over the long term, tax savings could be realized by reducing the need for urgent dental care provided through the city's social services programs as well as decreasing the strain on our local hospitals. No dollar figure can be affixed to the value of the long range health of today's population and of generations to come.

We urge the City of Orillia to bring fluoridation to the municipal water supply.

Sincerely,

Peter M. Dean D.D.S.

Muskoka-Simcoe Dental Society

From: Ryan de Laplante [mailto:rdelaplante@gmail.com]
Sent: Friday, February 24, 2012 9:08 AM
To: Andrew Hill; John Hoos; Julie Langpeter; Janet Nyhof
Subject: Re: Public consultation on water flurodiation

FYI, the EPA's official position on water fluoridation is that it is safe and effective, but the EPA employees union blew the whistle and demanded "an immediate halt to the use of the nation's drinking water reservoirs as disposal sites for the toxic waste of the phosphate fertilizer industry." They also said that the "EPA was unable or unwilling to resist external political pressure."

http://www.fluoridealert.org/hp-epa.htm

The pro-fluoridation racket tries to discredit that entire website as "quackery", but it was created and maintained by some of the top **independent** people in the industry, including the University of Toronto's Head of Preventative Dentistry.

It's a real shame that so many city councillors seem to have made up their mind already and did not attend Dr. Paul Connett's presentation. Just remember that respectable and trustworthy government organizations that say water fluoridation is safe and effective also said that cigarettes and asbestos are safe for decades, that aspartame is safe, that genetically modified food is safe, etc. despite all the independent science that says the opposite. Industry has enormous political pressure on policy makers.

Also don't forget that other cities are backing out of fluoridation, or rejecting proposals from the beginning:

http://www.fluoridealert.org/communities.aspx

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of Nicole_deLaplante@hotmail.com
Sent: Friday, February 24, 2012 9:34 PM
To: MAYOR EMAIL
Subject: Water Fluoridation

Dear Mr. Orsi,

My name is Nicole de Laplante, I am in grade 11 at Twin Lakes Secondary School and I am very concerned about the talk of putting fluoride in our water. My impression of the people pro for fluoridation is that they don't know or ignore the risks, “the relative toxicity levels of lead, fluoride, and arsenic were compared, and fluoride is slightly less toxic than arsenic and more toxic than lead". If there is even one risk, why would you put that upon the people of your city? Don't you want us to be healthy? If I don't want to be medicated, then I don't want it to be snuck into my drinking water. I suggest instead of wasting the money to put fluoride in the water, give it only to the people who want it through chewable pills, this way the fluoride is actually touching the teeth, which it does not when drinking water. The children I babysit have chewable fluoride pills they take before bed. This is a way more efficient way of getting the fluoride to the people who need it. Make these pills free to the people who need it and keep the rest of us out of it. I don't have a tooth decay problem, and I probably never will. I do not want to be SCARED to drink water, which already I am considering the chlorine and other stuff being added to the water: " The National Cancer Institute estimates cancer risks for people who consume chlorinated water to be 93% higher than for people who do not" Please represent your people well and vote NO for the water fluoridation in Orillia. I will NOT drink this water if it becomes fluoridated.

From: "dianne orton" <diniii@distributel.net>
Date: Fri, 24 Feb 2012 22:33:53 -0500
To: <mayor@orillia.ca>; <gjackson@orillia.ca>
Cc: <mfogarty@bell.blackberry.net>; <andrew.hill@bell.net>; <pcvc@sympatico.ca>; <linda.murray170@gmail.com>; <pat@kehoeassociates.ca>; <tonymadden@rogers.com>; <petebowen12@gmail.com>; <dwjenkinsqc@gmail.com>
Subject: Fw: Request For Experts To Debate Water Fluoridation Issue

Date February 24,2012

Mayor Orsi and Members of Council
City of Orillia
50 Andrew St. S., Suite 300
Orillia, Ontario L3V 7T5

Open letter to Mayor Orsi and Members of Orillia Council:

Re: Request For Experts To Debate Water Fluoridation Issu

A number of experts on both sides of the issue have shown an interest, and have participated, in discussions. However, in light of several experts' position that harm and injury inevitably will occur with the addition of fluoride to our drinking water, I feel we have a fiduciary responsibility to exercise due diligence in such a contentious issue. The question also arises whether industry is off loading liabilities of its toxic waste onto the public.

As you know, debates facilitate a high level of accountability for the representations that are being made by the experts. This would allow Council and members of the public to hear both sides, have questions answered by the experts, and would result in a more well informed decision.

April 17th or 18th, 2012 may be most suitable for some experts that have expressed an interest. Please, let me know at your earliest convenience so all parties can be accommodated.

Sincerely,

Name Dianne Orton
Phone Number (705) 326-6329
Address 357 Millard St,
Orillia, Ontario
L3V 4H5

-----Original Message-----
From: info@esolutionsgroup.ca <mailto:info@esolutionsgroup.ca> [mailto:info@esolutionsgroup.ca] <mailto:[mailto:info@esolutionsgroup.ca]> On Behalf Of mrolland@rogers.com <mailto:mrolland@rogers.com>
Sent: Monday, February 27, 2012 10:54 AM
To: Clerks Internet Email
Subject: water fluoridation

Please make note, I am against putting fluoride in our water system.

Marilyn Rolland

From: Maureen Jones [mailto:maureenj@pacbell.net]
Sent: Monday, February 27, 2012 3:02 PM
To: JASON COVEY
Subject: Fluoridation & Poor Children: Complete item

Thank you, Jason!

Baby Bottle Tooth Decay aka Early Childhood Caries:

After decades of promoting water fluoridation for the sake of disadvantaged children, the University of California San Francisco School of Dentistry announced on December 18, 2008 they had received a record $24.4 million from the National Institutes of Health to fight early childhood caries, also known as "baby bottle tooth decay" or "nursing caries".

Published dental literature has long noted fluoridation's failure:

1) Auge, K. Denver Post Medical Writer. Doctors donate services to restore little girl's smile. The Denver Post, April 13, 2004. **(Note: Denver, CO has been fluoridated since 1954.)**
"Sippy cups are the worst invention in history. The problem is parents' propensity to let toddlers bed down with the cups, filled with juice or milk. The result is a sort of **sleep-over party for mouth bacteria**," said pediatric dentist Dr. Barbara Hymer as she applied $5,000 worth of silver caps onto a 6-year-old with decayed upper teeth. Dr. Brad Smith, a Denver pediatric dentist estimates that his practice treats up to 300 cases a year of what dentists call Early Childhood Caries. Last year, Children's Hospital did 2,100 dental surgeries, many of which stemmed from the condition, Smith said, and it is especially pervasive among children in poor families.

2) Shiboski CH et al. The Association of Early Childhood Caries and Race/Ethnicity Among **California Preschool Children**. *J Pub Health Dent*; Vol 63, No 1, Winter 2003.
Among 2,520 children, the largest proportion with a history of falling asleep sipping milk/sweet substance was among Latinos/Hispanics (72% among Head Start and 65% among non-HS) and HS Asians (56%). Regarding the 30% and 33% resultant decay rates respectively; **Our analysis did not appear to be affected by whether or not children lived in an area with fluoridated water.**

3) California Department of Health Services, Maternal and Child Health Branch, 1995; *Our Children's Teeth: Beyond Brushing and Braces.*
33% of Head Start children and 13% of non-Head Start preschool children had Early Childhood Caries/Baby Bottle Tooth Decay (BBTD).
1) **In non-fluoridated** urban regions, **40%** of Hispanic preschool children had BBTD.
2**) In fluoridated** urban regions, **45%** of Asian Head Start preschool children had BBTD.

4) Allukian, M. Symposium Oral Disease: The Neglected Epidemic - What Can Be Done? Introduction: *Journal of Public Health Dentistry,* Vol. 53, No 1, Winter 1993. "Oral Disease is still a neglected epidemic **in our country**, despite improvements in oral health due to fluoridation, other forms of fluorides, and better access to dental care. Consider the following: **50 percent of Head Start children have had baby bottle tooth decay."** (Bullet #5 of 8.)

5) Barnes GP et al. Ethnicity, Location, Age, and Fluoridation Factors in Baby Bottle Tooth Decay and Caries Prevalence of Head Start Children. *Public Health Reports*; 107: 167-73, 1992.
By either of the two criterion i.e., two of the four maxillary incisors or three of the four maxillary incisors, the rate for 5-year-olds was significantly higher than for 3-year-olds. **Children attending centers**

showed no significant differences based on fluoride status for the total sample or other variables.

6) Kelly M et al. The Prevalence of Baby Bottle Tooth Decay Among Two Native American Populations. *J Pub Health Dent*; 47:94-97, 1987.
The prevalence of BBTD in the 18 communities of Head Start children ranged from 17 to 85 percent with a mean of 53%. The surveyed communities had a mixture of fluoridated and non fluoridated drinking water sources. **Regardless of water fluoridation, the prevalence of BBTD remained high at all of the sites surveyed.**

7) Watson MR et al. Caries conditions among 2-5-year-old immigrant Latino children related to parents' oral health knowledge, opinions and practices. *Community Dent Oral Epid*; 27: 8-15, 1999.
The finding of 47% of the children having experienced dental caries in their primary teeth does not differ greatly with other studies of low socioeconomic status and racial ethnic groups. **(Washington D.C. has been fluoridated since 1952.)**

8) Weinstein P et al. Mexican-American parents with children at risk for baby bottle tooth decay: Pilot study at a migrant farmworkers clinic. *J Dent for Children*; 376-83, Sept-Oct, 1992.
Overall, 37 of the 125 children (29.6 percent) were found to have BBTD. **Compliance in putting fluoride drops in bottle once a day was identical between BBTD and non BBTD groups.**

9) Bruerd B et al. Preventing Baby Bottle Tooth Decay: Eight-Year Results. *Public Health Reports*: 111; 63-65, 1996.
In 1986, a program to prevent BBTD was implemented in 12 Head Start centers in 10 states. In three years BBTD decreased from 57% to 43%. **Funding was discontinued** in 1990.

10) Von Burg MM et al. Baby Bottle Tooth Decay: A Concern for All Mothers. *Pediatric Nursing*; 21:515-519, 1995.
"Data from Head Start surveys show the prevalence of baby bottle tooth decay is about three times the national average among poor urban children, **even in communities with a fluoridated water supply."**

11) Blen M et al. Dental caries in children under age three attending a university clinic. *Pediatric Dentistry*; 21:261-64, 1999.
Of 369 children who attended the University of Texas-Houston Health Center **(Houston is fluoridated), 56%** between 2 and 3 years old had decay. Among the 3 year olds, **46%** had more than three decayed teeth. **The children without decay were weaned from the bottle at an average age of 10 months. Those with severe decay were weaned at 16.9 months.**

12) Kong D. City to launch battle against dental 'crisis'. *Boston Globe*, Nov. 27, 1999.
18% of children 4 years old and younger seen in the pediatric program at Tufts University School of Dental Medicine in 1995 had baby bottle tooth decay. Treatment can cost up to $4,000 per child. **Boston was fluoridated in 1978.**

13) Thakib AA et al. Primary incisor decay before age 4 as a risk factor for future dental caries. *Pediatric Dentistry*; 19:37-41, 1997.
In summary, initial primary incisor caries is a risk factor for developing future carious, extracted, and restored teeth.

14) Duperon DF. Early Childhood Caries: A Continuing Dilemma. *CA Dent Assoc J*; 23: 15-25, 1995.
The primary precipitating factor for **this 100 year old problem is prolonged use of the bottle or breast past 9 to 12 months of age.** North American Indians have reported an incidence of 53 percent, Inuit (Eskimo) children have shown a 60%-65% incidence and Mexican American migrant farm workers, 30%.

PIT AND FISSURE TOOTH DECAY

"Fluoride primarily protects the smooth surfaces of teeth, and sealants protect the pits and fissures (grooves), mainly on the chewing surfaces of the back teeth. Although pit and fissure tooth surfaces only comprise about 15% of all permanent tooth surfaces, they were the site of 83% of tooth decay in U.S. children in 1986-87."
Selected Findings and Recommendations from the 1993/94 California Oral Health Needs Assessment.

"Because the surface-specific analysis was used, we learned that almost 90 percent of the remaining decay is found in the pits and fissures (chewing surfaces) of children's teeth; those surfaces that are not as affected by the protective benefit of fluoride."
Letter, August 8, 2000, from Jeffrey P. Koplan, M.D., M.P.H., CDC Atlanta GA.

"Nearly 90 percent of cavities in school children occur in the surfaces of teeth with vulnerable pits and grooves, where fluoride is least effective."
Facts From National Institute of Dental Research. Marshall Independent Marshall, MN, 5/92.

THE DECEPTION

Fluoridation has historically been "sold" to politicians and civic leaders by using photos of rampant Baby Bottle/Sippy Cup Tooth Decay (BBTD), a highly visible decay of the upper front teeth. The cause of the decay is high levels of strep mutan bacteria. Fluoridated water at 1 ppm does not kill this bacteria that, 1) colonize on tooth surfaces, 2) thrive and multiply on sugars, and 3) pass their acidic waste onto the dental enamel causing the damage we call tooth decay.

50 percent of U.S. Head Start children have Baby Bottle/Sippy Cup tooth decay from high levels of strep mutans bacteria. A steady source of sugar is supplied to the bacteria by sipping fluids rather than drinking fluids from a cup. The bacteria's acidic waste first ravages the primary teeth and then continues on to decay the permanent teeth.

In January 2000, Dr. Kathleen Thiessen, Senior Risk Assessment Scientist at SENES Oak Ridge Inc. Center for Risk Analysis, reviewed the 1993-94 California Oral Health Needs Assessment for the City of Escondido (Keepers-of-the-Well.org, #17 Effectiveness) and stated in her critique:

1) For preschool children, Š any evaluation of the effectiveness of various measures (fluoridation) must control for the occurrence of BBTD and,

2) Any study of the effectiveness of a particular measure (fluoridation) in preventing dental caries must control for the presence of dental sealants, or the results will be meaningless. and,

3) In addition, if children with BBTD are thought to be more prone to developing caries in permanent teeth, then history of BBTD vs. caries incidence should be examined for both preschool *and* elementary children.

The dental literature is clear that elementary school children with a history of BBTD are indeed more prone to decay in permanent teeth. Therefore, controlling or adjusting for history of BBTD in elementary school children *should* be the norm but is *never done*! By *not* adjusting for BBTD history and sealants, dental studies of elementary school children can claim a (false) fluoridation benefit!

_____

Maureen Jones
Citizens for Safe Drinking Water - www.Keepers-of-the-Well.org
1205 Sierra Ave.
San Jose, CA 95126
408 297-8487

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of ddweber@sympatico.ca
Sent: Monday, February 27, 2012 6:35 PM
To: MAYOR EMAIL
Subject: Fluordation of city water

Mayor Orsi,
I am writing to express opinion that Orillia be free of fluoride in our water system.

Don weber

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Monday, February 27, 2012 11:23 PM
To: Gayle Jackson; MAYOR EMAIL
Cc: Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Don Jenkins; Tony Madden
Subject: Request For Debate

Dear Mayor Orsi and City Council:
With regard to the attached press release - more dates have become available. They are March 6th - March 12th inclusive.
Dr. Gardner, Dr. Ewing, and Dr. Cooney, who are in favour of water fluoridation, will have an opportunity to debate Dr. Connett, Dr. Beck (co-author of the book *The Case Against Fluoride*), and Dr. Osmunson (a dentist and spokesperson for the Fluoride Action Network), who are opposed to water fluoridation.
Please, request these individuals, who are pressing you to put fluoride into Orillia's water supply, to respond with the date that best suits their schedules, between March 6th and March 12th.
Is the city able to provide the venue?
We await your reply.
Thank you.
Orillia Citizens Against Fluoride
705-326-9075

MEDIA RELEASE
For Immediate Release
Monday, February 27, 2012
ORILLIA CITIZENS REQUIRE A PUBLIC DEBATE ON FLUORIDE
The City of Orillia is holding a Public Forum on Water Fluoridation, on February 29, 2012, at City Hall. This Forum has significant limitations, in that it skirts the majority of expert opponent voices and does not allow for the public to question the experts. In light of representations of experts in other Canadian towns and cities, where they have chosen to abandon fluoridated water, it would make the most sense to leave no stone unturned and hold a public debate of experts representing both sides of the issue. Debates are recognized for their high level of accountability for representations made by participants.
Proponents have represented that the safety and effectiveness of fluoridated water is assured. The threat of this position being imposed on Orillians without a public debate risks significant negligence. Experts have shown that ingested fluoride does not prevent tooth decay, and arguably does cause brain damage, cancer, and hip fractures, among many other illnesses.
The fertilizer industry has for many years created the illusion that this toxic waste product has some perceived benefit, when, in fact, all studies advanced by proponents will not withstand close scrutiny, nor have they have been peer reviewed. They would add this toxin to Orillia's water supply, facilitating their disposal of over 100

times the amount they would have us ingest, to ultimately end up in Lake Simcoe, Lake Couchiching, and the Great Lakes.

Orillia Citizens Against Fluoride request that city council join them in presenting a debate of the best available experts, from both sides of the issue, which allows for presentation of each side's case, backed by the best scientific studies on fluoridation, followed by questions of one side to the other, and then, questions from the public to any of the experts. Contact OCAF at 705-326-9075.

This debate should be impartially moderated by a respected media member, on whom the experts from each side can agree. It will serve as a role model for providing a complete and democratic decision making process with regard to issues of the type and magnitude of water fluoridation, throughout Ontario, and federally.

OCAF experts are ready, and they propose March 11th and 12th as their availability dates.

Media Release Contact: Orillia Citizens Against Fluoride
Telephone: 705-326-9075

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Tuesday, February 28, 2012 4:06 PM
To: Andrew Hill; Don Jenkins; Linda Murray; MAYOR EMAIL; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden
Subject: Peel Resolution - from Chair of peel region - re fluoridation

Dear Mayor Orsi, Members of Council

Apparently, fluorsilicic acid, which is used to fluoridate water, has yet to be controlled by Health Canada.

Attached you will find a resolution from Peel Region, dated February 6, 2012, requesting Health Canada to study, regulate, classify and assign a drug number to fluorosilicic acid,

All the best,
Colleen O'Neill

Office of the Chair

February 6, 2012 Resolution No. 2012-14

The Honourable Deb Matthews
Minister of Health and Long-Term Care
10th Floor, Hepburn Block
80 Grosvenor Street
Toronto, Ontario M7A 2C4

Dear Minister Matthews: Deb.

Subject: Fluoride Levels in Community Drinking Water and Toothpaste

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I am writing to advise that Peel Regional Council approved the following resolution at its meeting held on January 12, 2012:

> "That the Region of Peel request that Health Canada regulate the fluorosilicates hexafluorosilicic acid (H2SiF6) and sodium silicofluoride (Na2SiF6), used as a treatment for dental cavities in drinking water, as drugs under the Food and Drugs Act;
>
> And further, that all chemicals, especially fluorosilicates, added to drinking water for the purpose of treating dental decay undergo new drug applications and be assigned drug numbers by Health Canada;
>
> And further, that classification of fluorosilicates as drugs shall be based on at least one long-term toxicology study to determine health effects in humans;
>
> And further, that at least one properly conducted, double blinded, randomized placebo controlled clinical trial be used to provide effectiveness as the basis for a new drug classification;
>
> And further, that the Region of Peel make the above recommendations to Health Canada to reassure the citizens of Peel that the use of fluorosilicates added to drinking water for the purpose of treating dental decay is safe and what the health effects are;
>
> And further, that a copy of this resolution be sent to the Federal and Provincial Minister of Health, and Peel area MPs and MPPs;
>
> And further, that Peel MPs and MPPs be requested to follow up on this issue with the Ministers of Health and report back to Regional Council with a response."

On behalf of Regional Council, I request that you give consideration to the above resolution as soon as possible. Please quote the Region of Peel's resolution number in your reply.

Sincerely,

Emil Kolb

Emil Kolb
Regional Chair and Chief Executive Officer

EK:tr

c: Janette Smith, Commissioner of Health
Dr. David Mowat, Medical Officer of Health

Also sent to:

The Honourable Leona Aglukkaq
Minister of Health
House of Commons
Ottawa, ON K1A 0A6

Dr. Peter Cooney
Chief Dental Officer
Health Canada
A.L. 1501A, Tunney's Pasture
Ottawa, Ontario K1A OK9
Canada

Dr. Arlene King
Chief Medical Officer of Health
Public Health Division
11th Floor, Hepburn Block
Queen's Park
Toronto, Ontario M7A 1R3

Also Copied:

Eve Adams, MP – Mississauga-Brampton South
Stella Ambler, MP – Mississauga South
Brad Butt, MP – Mississauga-Streetsville
Bob Dechert, MP – Mississauga-Erindale
Parm Gill, MP – Brampton-Springdale
Bal Gosal, MP – Bramalea-Gore-Malton
Wladyslaw Lizon, MP – Mississauga East-Cooksville

Kyle Seeback, MP – Brampton West
David Tilson, MP – Dufferin-Caledon
Charles Sousa, MPP – Mississauga South
Dipika Damerla, MPP – Mississauga East-Cooksville
Bob Delaney, MPP – Mississauga-Streetsville
Linda Jeffrey, MPP – Brampton-Springdale
Jagmeet Singh, MPP – Bramalea-Gore-Malton
Vic Dhillon, MPP – Brampton West
Sylvia Jones, MPP – Dufferin-Caledon
Amrit Mangat, MPP – Mississauga-Brampton South
Harinder Takhar, MPP – Mississauga-Erindale

From: John and Shelley McLean [mailto:jsmclean96@bell.net]
Sent: Tuesday, February 28, 2012 10:33 PM
To: JASON COVEY
Subject: Personel Floridation Experience

Good Morning Sir,

By now you have heard more nay sayers than you wanted to about this issue. I would like you to have another side to this story that may help peoples understanding how important this is to the community. However, my position in a local company here does not allow me to actively participate in this debate.

I moved here four years ago after living for 20 years in the first community in Canada to fluoridate the water. One of the first things I noticed about the people here was their oral health. In addition to dull, grey/brown teeth, everyone had bad breath. As I quizzed people I heard the same stories about lots of dental work and a series of dental visits no one liked.

After a couple of years here and a few visits to my dentist back at home, my dentist began to question why my teeth had started to deteriorate. Things that he had decided to watch over a couple of years had turned into full cavities in a time frame he was not used to seeing in my home town. The filling of cavities began. Two years ago, I was able to move my family here, found a dentist, and was re-assessed. I have thousands of dollars of work to do, even with a dental plan, which includes removal of my wisdom teeth at the age of 50. As it happens, the dental surgeon that removed 2 of these teeth, grew up in my home town and explained the lack of fluoride in Orillia was the reason.

A look back on my dental history quickly shed a light what has happened to my teeth. I have always had bad teeth. Every 6 months I was getting a filling. Teeth brushing was not in question, just heredity. I would take the fluoride treatments in the dentists office, because that was all that was available 40+ years ago. We lived in the country on well water for my teen years with little exposure to the city's fluoridated water. In my 20's, I moved into the city and my dental health improved. I would go years without a cavity and having to only replace existing fillings as required. After living there for 20 years, I leave the community, and I begin having problems I have not had in years.

In my position with a company in Orillia, I have had many discussions with people that have moved to the region from other places in Ontario. My case is a similar story to theirs. They immediately have issue with their teeth and have begun taking actions such as the fluoridated rinses and stronger tooth pastes to prevent the decay from progressing.

As a parent, I have a real fear for my children's dental health. Being born in a fluoridated community and having that as the only water they have known, we are doing what we can to supplement the fluoride they receive. I look at the people I work with and the children my kids play with and worry about there overall health. Many physical health issues have been linked to gum disease and they are only really beginning to do the research on that link.

I have shared this story and do not mind you using this as you discuss the issue with people. If you want to talk to me further, please feel free to contact me at 705-327-8229.

Thank You,

John McLean.

Introduction and background

The Regional Municipality of Peel has a population of 1,171,372 (StatsCan, 2005) and is on the western border of the City of Toronto in the Province of Ontario, Canada. From 2001 to 2004, the population grew by 18.4%, the second highest rate of growth in Ontario. It consists of the cities of Mississauga, Brampton and Caledon. Municipal water fluoridation has been in place since 1960's and covers about 95% of the population.

The City of Caledon contains the town of Bolton with a population 21,000 (fluoridated in 2002); a rural area of 18,000 people supplied by non-municipal wells; two smaller towns, 6 villages and10 hamlets with a population of 12,000 people, of whom 6,600 are children from 0 to 14 years, that are supplied by 10 non-fluoridated municipal wells. The population of Caledon is characterized as married; unilingual English, lived at same address for at least 5 years, Canadian-born, well educated, employed, having relatively high incomes and owning their own homes.

The Region of Peel published a Children's Dental Health Report (CDH) in June of 2003 (RPHU, 2003). The report was based on dental surveys performed in 2001 and indicated that 50% of children, aged 5 to 13, living in Caledon had a history of dental caries compared to 37% of children in Mississauga and 38% of children in Brampton. The overall mean severity as measured by deft + DMFT (decayed, extracted and filled primary teeth plus Decayed Missing and Filled permanent Teeth) was 1.6 for Caledon compared to 1.0 for Brampton and 1.1 for Mississauga. A higher proportion of the children in Caledon had dental sealants, 32% compared to 13% and 14%; had caries restored 62% compared to 51% and 54%; a lower proportion had un-restored caries, fluorosis and plaque. The lack of fluoridation was postulated as the major factor in the higher dental caries scores for the children in Caledon

Accordingly, the Region of Peel Health Unit (RPHU) decided to recommend fluoridation of Caledon's the water supply. Peel Region enacted a bylaw to do so on condition that the RPHU first commission a study by an independent third party to determine the possible factors associated with the difference in caries scores between the children of Caledon and the children from the rest of the region. The RPHU approached and contracted with the Community Dentistry Department at the Faculty of Dentistry, University of Toronto for the study.

2757 Determinants of caries in adjacent fluoridated and non-fluoridated cities

D. ITO, University of Toronto, Canada

A 2001/02 oral health survey of school-aged children conducted in Peel Region, Ontario, Canada found that 50% of children from non-fluoridated, semi-rural, affluent Caledon had dental caries compared to 37% of children from the adjacent, urban, higher immigration, fluoridated city of Brampton. Objectives: We set out to confirm the difference in dental caries between children in Caledon and Brampton and to determine what factors, including fluoridated water, might explain any difference. Methods: Two calibrated hygiene-led teams surveyed 1047, 7-year-old children in 25 schools matched by SES from the two cities. Parental questionnaires on the determinants of oral health were returned by 411, home drinking water samples by 384. Drinking water was also collected from the schools. Water samples were analyzed for fluoride concentration using the Orion 96-09 Combination Fluoride Electrode. Data were entered on EpiData and analysed with SPSS ver 12.0. Adjusted odds ratios were calculated using logistic regression. Results: We found that 61% of Caledon children and 64% of Brampton children had deft + DMFT = 0. The deft + DMFT score for children from Caledon was 1.07 and from Brampton 1.14. Factors associated with deft + DMFT>1 were: the absence of dental sealants (OR=0.36, p=0.035); last dental visit for check-up and cleaning (OR=0.17, p<0.0001); fed infant-formula post-natally (OR=0.48, p=0.026); did not take multivitamins (OR=2.26, p=0.005); and child, mother and father born outside Canada (OR=4.86, p=0.01). Some children in fluoridated Brampton drank non-fluoridated, bottled water; some children from non-fluoridated Caledon had moved there from fluoridated communities. Conclusion: The effect of fluoridation on caries in these communities was not evident given the matching of the fluoridated Brampton schools to the higher SES of Caledon schools plus the variable exposure to fluoridation within the communities.

Assessment of Simcoe-Muskoka January 2009 Report: Focus on Oral Health

Orillia Public Forum February 29, 2012

GW Cooper
Public Policy Advisor
People for Safe Drinking Water
February 25, 2012

Figure 3

Relationship Between Oral Health of 5-year-olds and Percentage of Population with Fluoridated Water by Ontario Health Units* 2005-07

* 30 out of 36 Ontario Health Units provided data
Data Source: Ontario Association of Public Health Dentistry Survey of Ontario Health Units, August 2008

Source: S-MDHU Report January 2009

Summary

- Slide 4's assessment shows that the S-MDHU Report is incomplete, self-contradictory, and misleading. E.g., nothing on dental fluorosis, just caries.

- Overall, slide 4 suggests fluoridated drinking water does not contribute significantly to dental health. Orillia Council should require the S-M District Health Unit to respond to the questions posed therein.

- As it stands, the 2009 Report is not an adequate or sound basis on which Orillia Council should decide to start fluoridating its residents' drinking water.

- Other available studies show there is no cause-effect relationship between the extent of fluoridation and level of community oral health. See slides 5 and 6.

- Greater focus on proven dental health measures are much more effective, including: targeted and sustained community counselling on diet; regular toothpaste-toothbrush use; flossing; regular dental checkups; better use of Ontario's CINOT and Healthy Smiles programs. As Europe demonstrates:

  Caries is not the manifestation of fluoride deficiency.
  It is the result of generally poor nutrition and inadequate dental hygiene.
  "Unwholesome habits resulting in caries are not eliminated by the fluoridation of drinking water; on the contrary, they are promoted."

Evaluation of S-MDHU Report January 2009

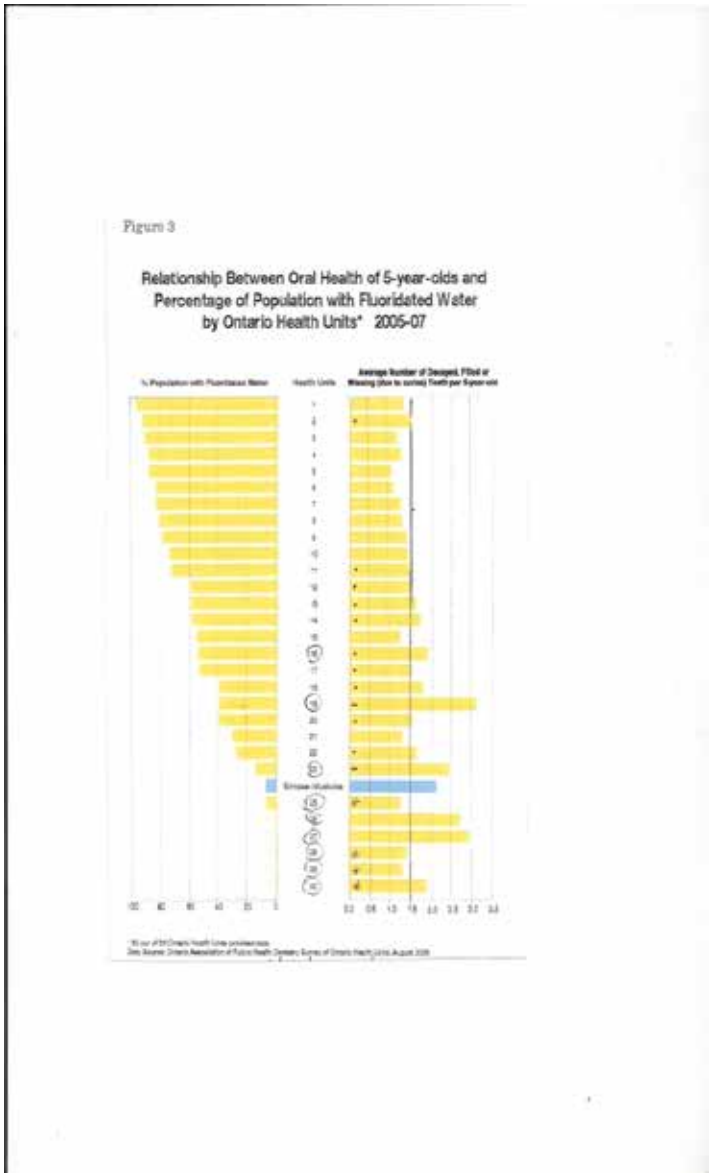
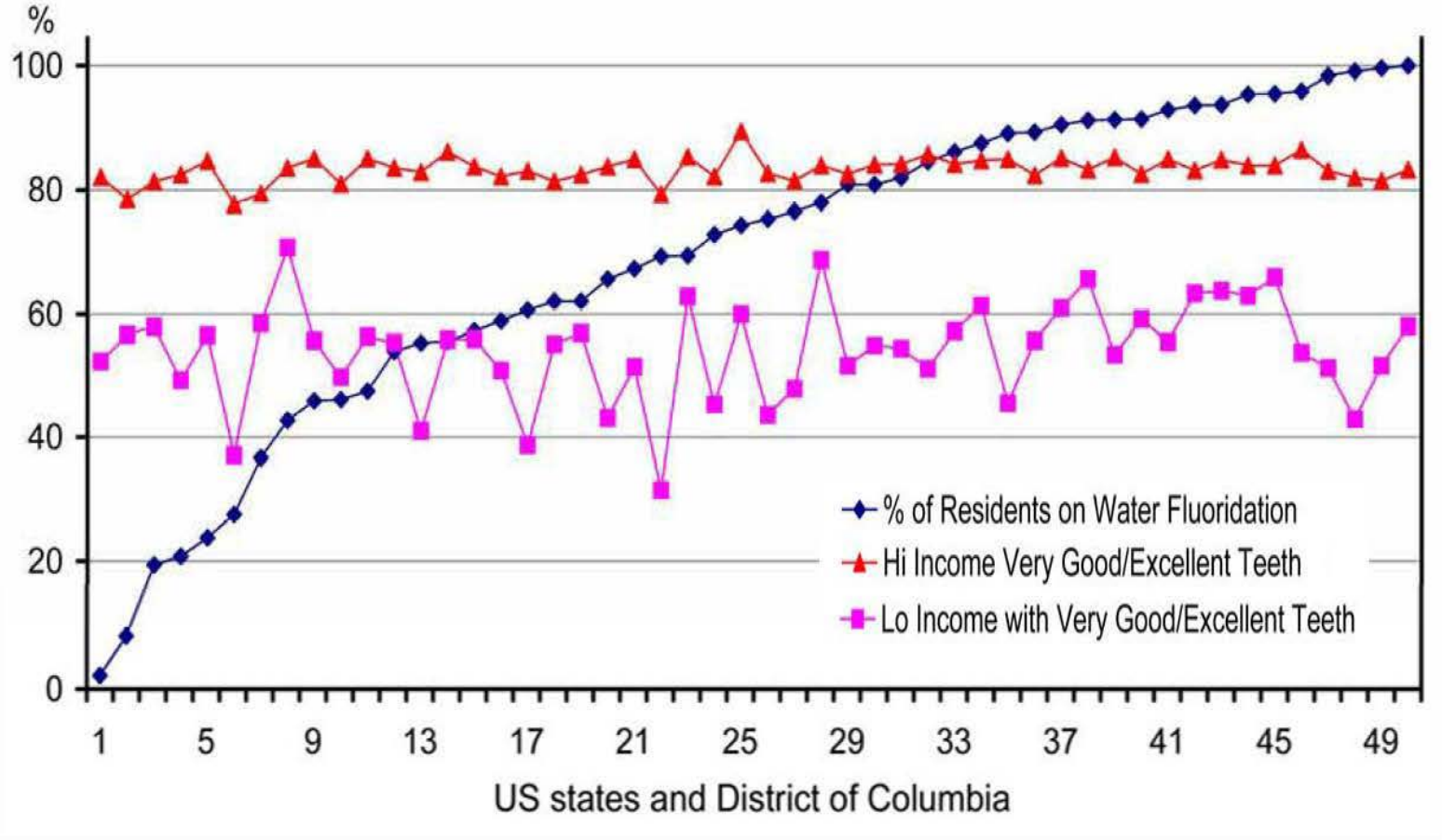


Figure 3

Relationship Between Oral Health of 5-year-olds and Percentage of Population with Fluoridated Water by Ontario Health Units* 2005-07

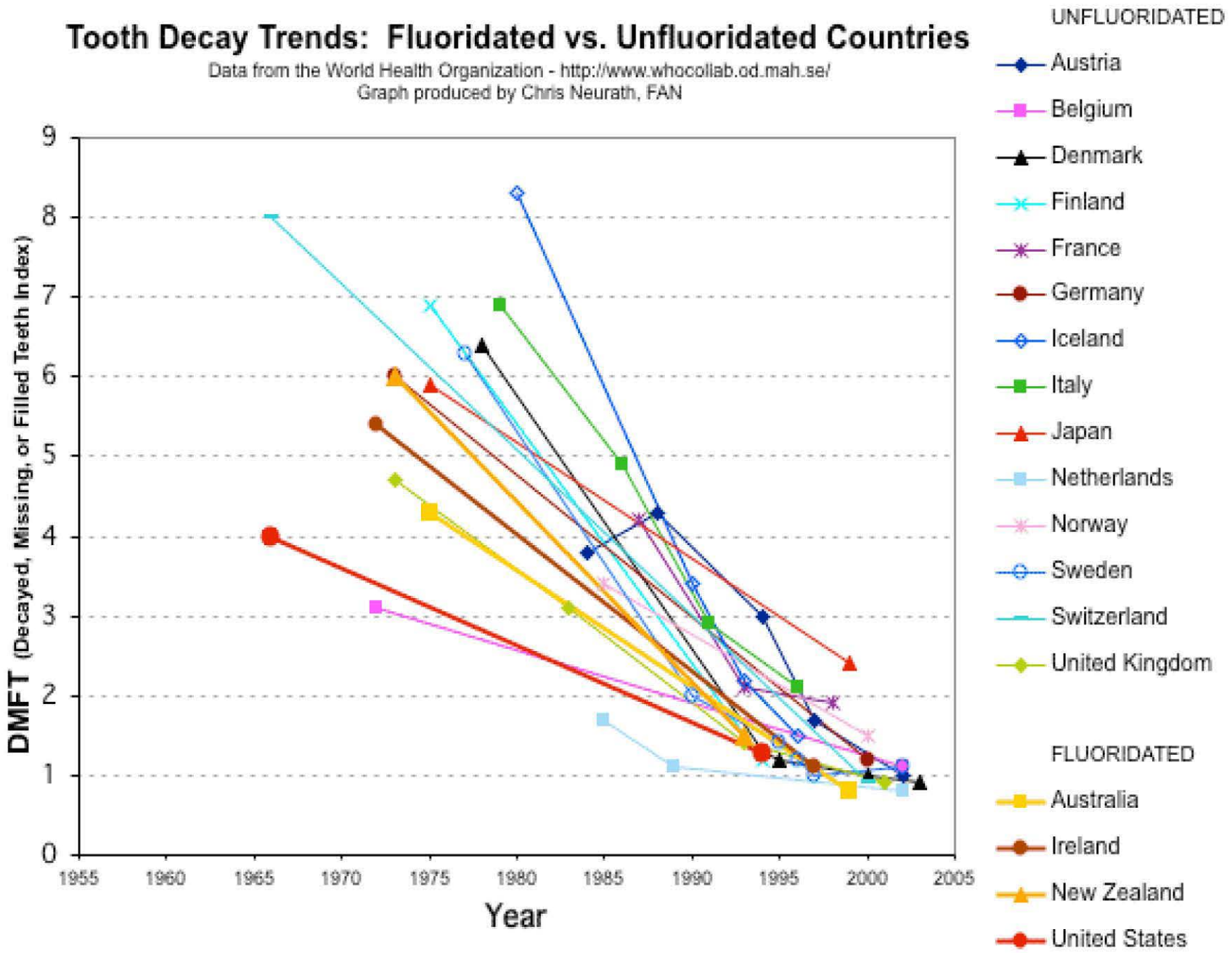
- Why do fluoridated DHUs 19 & 23 have higher DMFTs than S-MDHU and why do unfluoridated DHUs 25, 28, 29, & 30 have lower DMFTs than S-MDHU?
- 10 of 30 DHUs surveyed have DMFTs ranging from 1.0 to 1.4 with fluoridation coverage varying from 75% to 95%. But the DHUs with highest coverage of fluoridation don't have the lowest DMFT levels.Why?
- Why no Fig 1 or 3 charts for 7, 9, 13 year olds?
- Why no DMFT data for Orillia per se and no analysis of role of Orillia's demographics in tooth decay?
- Why is Report's DMFT data 5-7 years out of date?
- Why no data for 6 DHUs? Could distort results.
- Re Table 1, it's wrong to claim the 1.4 DMFT for S-M 13 year olds is due to their adult teeth not being in place for long. Such teeth erupt after their primary teeth fall out and can be as much as 6 years in the mouth. Note the S-M DMFT is only 4% less than that for all 30 DHUs. Not a big gap!
- These are major errors and omissions along with flossing, dental fluorosis and other adverse health effects.

USA Dental Health, FDW, Income



Source: US Department of Health and Human Services Survey (DHHS, 2003). Graph per Dr. W. Osmunson, DDS, MPH

Finding: No relationship exist between fluoridation and dental health.


Tooth Decay Trends: Fluoridated vs. Unfluoridated Countries
Data from the World Health Organization - http://www.whocollab.od.mah.se/
Graph produced by Chris Neurath, FAN
DMFT (Decayed, Missing, or Filled Teeth Index)
0
1
2
3
4
5
6
7
8
9
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
Year
UNFLUORIDATED
Austria
Belgium
Denmark
Finland
France
Germany
Iceland
Italy
Japan
Netherlands
Norway
Sweden
Switzerland
United Kingdom
FLUORIDATED
Australia
Ireland
New Zealand
United States

Presentation to Windsor Utilities Commission, Special Fluoridation Meeting Februrary 29, 2012

Mr. Mayor, council members and board members, thank you for allowing me to address you on the important issue of artificial water fluoridation. My name is Kim DeYong and I'm here as a Windsor resident, a concerned parent and as a representative of a growing group of citizens campaigning for safe water known as Fluoride Free Windsor[1].

Dr. Heimann and health authorities want to convince us that ingesting fluoride is safe. They do so by saying that Health Canada has reviewed the studies available and finds no credible evidence of toxicity risk and that fluoride meets regulatory standards.

But there is a problem with these claims of safety.

First, the reviews that health authorities refer to (instead of citing primary research) are mostly done by panels of fluoridation promoters that have been selected by governments that support fluoridation[23]. When they refer to any independent reviews[4] that disagree with the safe and effective message they give misleading statements about these review's findings. Water fluoridation experts[5] as well as scientists that conduct the primary research[6] and independent reviews more often come to different conclusions than these fluoride supporting panels.

Secondly, the Safe Drinking Water Act[7] is clear that all water systems must meet licensing requirements; the license[8] requires that chemicals used in our drinking water system meet the standard NSF60. This standard requires that the chemical undergo toxicological evaluation[9]. The US Environmental Protection Agency, the National Sanitation Foundation and Dr. Heimann himself admit these safety studies have never been done. And so hydrofluorosilicic acid does not meet the legal requirement that it conform with standard NSF60. The law says hfsa must meet the standard, the standard says the product must be tested, health authorities admit no tests have been done on the product, no tests means no proof of safety, no compliance with the law and no legal product with which to fluoridate[10].

The Province has provided a document to assist municipalities with the management of their drinking water systems titled: Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils[11]. In this guide is a demonstration of the ideal drinking water model and no fluoridation step is shown. Further, the guide warns municipal councillors of the Standard of Care[12] coming into effect on January 1, 2013 which puts an unprecedented duty of care on municipal councillors responsible for their drinking water system. Dr. Arlene King, the Chief Medical Officer of Health has stated that "The decision to fluoridate local drinking water is made by each municipality in consultation with local residents." I have several letters[13] and emails from local residents that are concerned about the safety of their drinking water. They want their water to be safe and free of unnecessary chemicals. I know there are many Windsor, Tecumseh and Lasalle residents that have contacted their municipality asking them to cease fluoridation.

Dr. Heimann claims that it is not harmful to dump 99% of the hydrofluorosilicic acid into our environment by citing a study done in Montreal Quebec[14] (PQ is mostly not fluoridated). This study was conducted by a medical doctor, not an ecologist, and dealt with fluoride levels in the St. Lawrence River which has much more water volume and movement than does the Detroit River and the Great Lakes. What Dr. Heimann has failed to do is provide statistical data on **our** environment and **our** bodies of water to prove that the practice he endorses is in compliance with environmental legislation. The Canadian Association of Physicians for the Environment[15] and Great Lakes United passed resolutions[16] calling for an end to artificial water fluoridation and the Windsor Essex County Environment Committee also passed a motion to recommend the city stop fluoridation.

In the absence of scientific consensus it would be prudent for municipalities to exercise the precautionary principle[17]. This principle requires that we consider the possible benefits, the possible harms and whether there are feasible alternatives for producing the benefit. For fluoride the benefit is slight[18] if any and does not pertain to a threat to public health. Possible harm is great[19] and almost certain for some harm like dental fluorosis[20] and thyroid suppression[21]. There are harmless and accessible alternatives for attaining the desired benefit[22] and so fluoride does not pass the test of the precautionary principle.

Windsor Utilities Commission has a mandate to "deliver an abundance of **clean**, **reliable**, and **safe** water that enhances the quality of life of Windsor's residences and businesses." The town of Lakeshore's water engineers advised council to discontinue fluoridation because they determined that "fluoridation is a process that does not contribute to the municipality's objective of providing safe drinking water."[23] This was determined even after Lakeshore water engineers consulted with the Medical Officer of Health, Dr. Heimann. By recommending Windsor Utilities Commission mass medicate their customers without informed consent, Public Health and Dr. Heimann are asking YOU to do to everyone what they could do to no one person.

In closing, I would ask that the Windsor Utilities Commission recommend that the City of Windsor discontinue artificial water fluoridation, to be more protective of all constituents and the environment because the product, hydrofluorosilicic acid has not been shown to be in compliance with Provincial safety regulations and Federal environmental legislation[24]; and because the municipal water supply should be as safe as possible, not a delivery vehicle for unregulated and unsafe drugs.

Thank you all for your time.

[1] Website of local group of concerned citizens campaigning for safe water www.FluorideFreeWindsor.com
[2] Health Canada – Guidelines for Canadian Drinking Water Quality; Guideline Technical Document – Fluoride – December 2010 Critique by Diane Sprules BSc, MSc. Attached via email as supporting documentation
[3] Response to the Health Canada (2009) report on Fluoride in Drinking Water by Paul Connett, PhD, Professor Emeritus of Environmental Chemistry, St. Lawrence University and Director of Fluoride Action Network. Attached via email as supporting documentation
[4] National Research Council assembled a panel of esteemed independent scientists that took over 3 years to review fluoride science and determined there were many reasons to be concerned about water fluoridation, their work is culminated in a publication titled Fluoride in Drinking Water: A Scientific Review of EPA's Standards http://www.nap.edu/catalog.php?record_id=11571
[5] Water Fluoridation Experts is a list of professionals compiled by Fluoride Free Windsor. These experts have provided their contact information and are willing and available to answer any and all questions policy makers might have regarding the misleading claims that water fluoridation is safe and effective. Attached via email as supporting documentation and for reference to policy makers.
[6] Dr. Hardy Limeback is the Head of Preventive Dentistry at the University of Toronto and the former President of the Canadian Dental Research Association. He was also an esteemed panel member of the NRC's Review of Fluoride in Drinking water. Dr. Limeback has provided a statement for municipal councillors with respect to the funded peer-reviewed research he's done on fluoride and fluoridation. This statement is attached via email as supporting documentation. The internet has a plethora of articles, lectures, interviews and videos of Dr. Limeback's position.
[7] Safe Drinking Water Act 2002 http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_02s32_e.htm
[8] City of Windsor and Windsor's license: Municipal Drinking Water License Number 025-101, Schedule B section 14.0
[9] NSF Fact Sheet on Fluoridation Chemicals
http://www.nsf.org/business/water_distribution/pdf/NSF_Fact_Sheet.pdf
[10] No Means No, NSF Certification if Fraudulent by Carole Clinch
http://fluoridefreewindsor.files.wordpress.com/2012/02/nsfcertificationisfraudulent.pdf
[11] Taking Care of Your Drinking Water: A Guide for Members of Municipal Councillors
http://www.portal.gov.on.ca/drinkingwater/dw_el_prd_043831.pdf
[12] Standard of Care, municipal drinking water system. This section of the Safe Drinking Water Act comes into effect on January 1, 2013. http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_02s32_e.htm#BK22
[13] A sample of the letters/emails from concerned residents of Windsor, Tecumseh and Lasalle that feel their tap water is not safe and that hydrofluorosilicic acid is harmful. Attached as supporting documentation are letters from Korry Benson, Clara Zorzati, Mare Moore and Tia Toutant
[14] Osterman, J.W., *AJPH* 1990, 80(10): 1230-1235
[15] Canadian Association of Physicians for the Environment resolution to terminate artificial water fluoridation
http://www.cape.ca/res_cardfile.shtml?cmd[227]=i-227-e29cb89dc0610f57e31e5f550b936ed4&cmd[252]=i-252-e29cb89dc0610f57e31e5f550b936ed4
[16] Great Lakes United resolution that the practice of artificial drinking water fluoridation be terminated
http://www.glu.org/en/node/337
[17] Canadian Environmental Law Association: Precautionary Principle
http://www.cela.ca/collections/pollution/precautionary-principle
[18] Fluoridation May Not Do Much for Cavities, Globe and Mail; this article reports on Statistics Canada data that shows next to no difference between the dental health of residents of barely fluoridated Quebec and heavily fluoridated Ontario http://www.theglobeandmail.com/life/health/flouridation-may-not-do-much-for-cavities/article1535873/
[19] Bibliography of some studies pertaining to fluoride ingestion http://www.slweb.org/bibliography.html
[20] Bibliography of some studies pertaining to Dental Fluorosis http://www.slweb.org/bibliography.html#fluorosis
[21] Bibliography of some studies pertaining to Thyroid http://www.slweb.org/bibliography.html#thyroid
[22] Alternatives to ingesting fluoride through municipal tap water include Provincially funded programs such as Healthy Smiles and Children In Need of Treatment; fluoridated toothpastes and rinses; topical fluoride treatments from dentists and listed here is a data base of alternatives: http://www.slweb.org/bibliography.html#alternatives
[23] Town of Lakeshore Engineering and Infrastructure Services Environmental Services Division: Fluoridation A Review of Fluoridation of Drinking Water in Lakeshore October 12, 2011. Attached via email
[24] Species At Risk Act http://www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=ED2FFC37-1
Canadian Environmental Protection Act http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D44ED61E-1;
Hazardous Waste Act http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=211AFAEC-1

HOW MUCH HYDROFLUOROSILICIC ACID WILL BE PUT INTO OUR LAKES?

I have done an estimate of the amount of Hexafluorosilicic Acid (HFSA) that would be required to treat the water in Orillia - pop'n 30,000 people. My assumptions are as follows;

- a planning number widely used is 0.45 cu meters per person per day for most cities.
- 30,000 people x 0.45 x 365 days = 4,927,000 cu. Meters per year
- at a target concen'n of 0.7 ppm, we need 0.7 x 4.927 = 3.45 cu M of available Fl
- if this substance is a 24 % solution of fluoride, then we need 3.45/0.24 = 14.4 cu M of hexafluorosilicic acid to be purchased in one year.
- one cu M = 1000 liters, and 14.4 x 1000 = 14,400 litres per year
- at 3.8 liters per US gallon, this is = 3789 US gallons per year
- at 45 US gallons per barrel, **this is 84.2 barrels per year of Hexafluorosilicic Acid that would get dumped into our lake each year!**

- IF this is correct, this is shocking and totally ridiculous!

…….

Let me cross check this another way just to see if this is in the correct ball-park;

- A planning number widely used is $1 per person per year to buy the chemical
- 30,000 people at $1.00 per year = $ 30,000 per year operating budget
- we know that the price is approx. $1500 per ton (2000 lbs) = $0.75 per pound (as chemicals go, this stuff is almost free!)
- 30,000/1500 = 20 tons or 20 x 2000 = 40,000 lbs
- if it was water, we know that 1 US gallon of water weights about 8 pounds, therefore 40,000/8 = 5000 US gallons
- in order to convert this to Volume of Hexafluorosilicic Acid, (so we can compare with the above result) - we need to allow for its specific gravity (1.22). Its vol will be less than if it was water, because it is heavier than water. 5000/1.22 = 4098 US gallons per year
- since this is within 8% of the value above (3789), we can say that these two numbers are approximately the same! Considering the relatively wide tolerance on all of my assumptions, this is good agreement.
- 4098/45 = **91 barrels per year!**

SO, on average, it can be concluded that about **88 forty-five gallon drums** of HEXAFLUOROSILICIC ACID will be DISPOSED OF IN OUR LAKE **EACH YEAR** AS A RESULT OF FLUORIDATION in Orillia!!!

NOTE: 88 barrels = 3960 US gallons = 15,000 litres

HOW MUCH ARSENIC COULD BE CONTAINED IN THIS?

Again my assumptions are as follows;

- from the article "CDC Admits Arsenic in Fluoride" (attached) - of course we know they mean in Hexafluorosilicic Acid!
- average levels **are** 0.43 ppb, the high **was** 1.66 ppb, **allowable** 2.5 ppb, EPA **limit** 10 ppb, TARGET 0.000 ppb
- and of course they mean **when** this stuff is diluted in lets say a 0.7 ppm Fl water system
- at the allowable limit of 2.5 ppb;
- 0.7 ppm is 700 ppb, 700 ppb is 280 times larger than 2.5 ppb (700/2.5)
- therefore, the amount of ARSENIC put in the water in Orillia (from above) is probably in the order of 3960/280 = 14.1 US gallons per year!!!! Can this be right?
- Or, at 10 ppb, there would be **56.4** US gallons per year! (14.1x10/2.5)
- Or, at 1.25 ppb, there would be 7.05 US gallons per year! (divide by 2)
- Or, at 0.625 ppb, there would be **3.525** US gallons per year! (divide by 2, again)

This sounds like a LOT of arsenic, no matter what the concentration!

- And lets not forget that the target is ZERO, and any amount of arsenic is carcinogenic.

In summary, we can say that there is probably between 3.5 and 56 US gallon per year of pure ARSENIC dumped into us and the lake each year!

……..

HOW MUCH LEAD WOULD BE IN THIS?

From the "DRINKING WATER QUALITY GUIDELINES", it is stated that, to be suitable for public drinking water fluoridation use, HEXAFLUOROSILICIC ACID can have up to 200 ppm of lead! (the vast majority of the time, it is actually MUCH lower than this – thank goodness, BUT IT COULD BE THIS HIGH AND STILL BE SUITABLE!)

This is the same as saying 200 mg in 1 kg

In 40,000 pounds of HFSA (see above), or 18,143 kg, there could be up to 200 x 18,143 = 3,628,600 mg, or **3.628 kg of DISOLVED LEAD**! This is a very significant amount! Lets hope that this does NOT happen, BUT, it could happen, according to the guidelines.

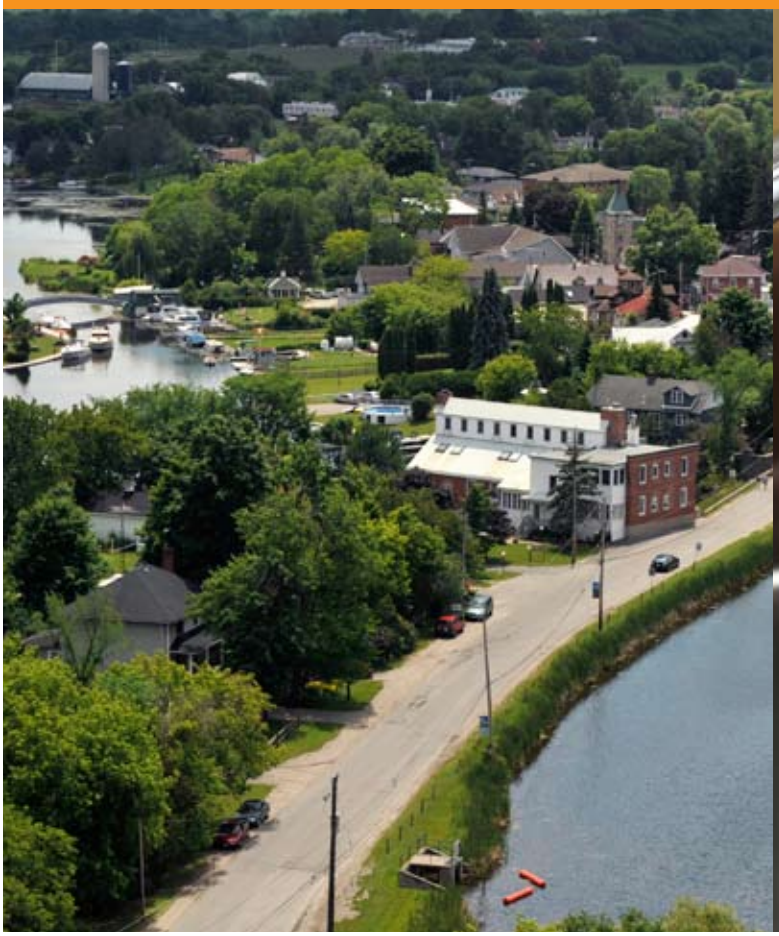
……

From the attached HFSA lab report, the lead content was reported to be less than 1 ppm.

If it was 1 ppm, this would mean that there would be 18,143 x 1 = 18,143 mg, or 0.0181 kg of dissolved lead dumped into the lake each year! This is a small amount, but, again, should be ZERO!.

TAKING CARE OF YOUR DRINKING WATER

A GUIDE FOR MEMBERS OF MUNICIPAL COUNCILS



www.ontario.ca/drinkingwater

Ontario

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- For answers to general questions, contact the Ministry of the Environment at **1-800-565-4923**
- Legal Disclaimer – This guide should not be viewed as legal or other expert advice. For specific questions regarding the legal application of the Safe Drinking Water Act (SDWA) and its regulations, please consult a lawyer and/or review the text of the Act at **www.e-laws.gov.on.ca**

Sources
Much of the material in this guide has been adapted from the Ontario Municipal Water Association's 2004 handbook "Ontario Drinking Water Stewardship Responsibilities" with their permission. Information was also obtained from the following sources:

- American Water Works Association, 2009, Water Basics for Decision Makers
- Emergency Management Ontario, 2010, Emergency Management Doctrine for Ontario
- Environment Canada, 2010, 2010 Municipal Water Use Report: 2006 Statistics
- Ontario Ministry of the Attorney General, 2002, Part Two Report of the Walkerton Inquiry
- Ontario Ministry of the Environment, 2006, The Clean Water Act: Promoting Municipal Awareness and Understanding
- Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials
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- Ontario Ministry of the Environment, 2007, Towards Financially Sustainable Drinking-Water and Wastewater Systems
- Ontario Ministry of the Environment, 2009, Annual Report 2007-2008 Chief Drinking Water Inspector
- Ontario Ministry of the Environment and the Ontario Ministry of Natural Resources, 2009, Safeguarding and Sustaining Ontario's Water Resources for Future Generations
- Pollution Probe, 2006, The Source Water Protection Primer

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A Message from the Chief Drinking Water Inspector of Ontario

Ensuring the safety of Ontario's drinking water is a shared responsibility. It requires dedication and a commitment to constant vigilance from many partners, ranging from governments to treatment plant operators. More than 80 per cent of Ontario's population receive their drinking water from a municipal drinking water system, and much of the important work of maintaining safe drinking water for the people of Ontario is done at the municipal level. Drinking water quality and inspection results consistently show that Ontario's municipalities are doing an exceptional job in this regard. If millions of Ontarians take clean, safe drinking water for granted, it is because so many dedicated public officials do not.

This guide is intended to support you in your role as a municipal councillor who may have oversight responsibilities for one of these drinking water systems. The guide will help you understand your responsibilities under the Safe Drinking Water Act, 2002 and provide you with information on how Ontario's drinking water is safeguarded. It will help answer questions about your statutory standard of care responsibilities, and it provides some basic reference material on drinking water. It also has some practical advice on additional actions you can take to be better informed and questions to test your knowledge.

As Chief Drinking Water Inspector, I look forward to continuing to work with Ontario's municipalities to safeguard Ontario's drinking water.

John Stager
Chief Drinking Water Inspector of Ontario

A Message from Ontario's Chief Medical Officer of Health

Safe drinking water is one of the key pillars of public health in Ontario. We all know that if a drinking water system fails, serious life-threatening consequences can result.

Ontario's public health units work together with municipalities in many ways to protect the public, including when your community's drinking water may not be safe for consumption. As municipal councillors with oversight responsibilities for municipal drinking water systems, I encourage you to understand how your role can directly affect the health of your community and to keep it as a paramount consideration in your decision-making.

Dr. Arlene King
Chief Medical Officer of Health of Ontario

> *"Since Dr. John Snow's 1854 discovery in London, England, that drinking water could kill people by transmitting disease, the developed world has come a long way towards eliminating the transmission of water-borne disease. The Walkerton experience warns that we may have become victims of our own success, taking for granted our drinking water's safety. The keynote in the future should be vigilance. We should never be complacent about drinking water safety."*
>
> — Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

WHAT YOU NEED TO KNOW

about your drinking water responsibilities

Ontarians are entitled to expect safe, high quality drinking water. It is a matter vital to public health. As a member of municipal council, you have an important role to play to ensure that your community has access to safe, high quality drinking water — and you are legally obliged to do so.

HERE ARE THREE THINGS TO REMEMBER AS A MUNICIPAL COUNCILLOR:

It's Your Duty. The Safe Drinking Water Act, 2002 includes a statutory standard of care for individuals who have oversight responsibilities for municipal drinking water systems that can extend to municipal councillors as of January 1, 2013. There are legal consequences for negligence, including possible fines or imprisonment. (Read more on page 7 of this guide.)

Be Informed. Ask questions. Get answers. You don't have to be an expert in drinking water operations, but you do need to be informed about them. Your decisions can have an impact on public health. Seek advice from those with expertise and act prudently on that advice. (Check your knowledge on page 11.)

Be Vigilant. Complacency can pose one of the greatest risks to drinking water systems. It is critical that you never take drinking water safety for granted or assume all is well with the drinking water systems under your care and direction. The health of your community depends on your diligent and prudent oversight of its drinking water. (Read how the actions of one municipal council impacted their community on page 9.)

> ***"Water is unique as a local service. It is, of course, essential to human life and to the functioning of communities, (and) the consequences of a failure in the water system (are) most seriously felt by those who depend on it locally. Municipal ownership, and the ensuing responsibilities, should provide a high degree of public accountability in relation to the local water system."***
>
> — Justice Dennis O'Connor, 2002,
> Report of the Walkerton Inquiry

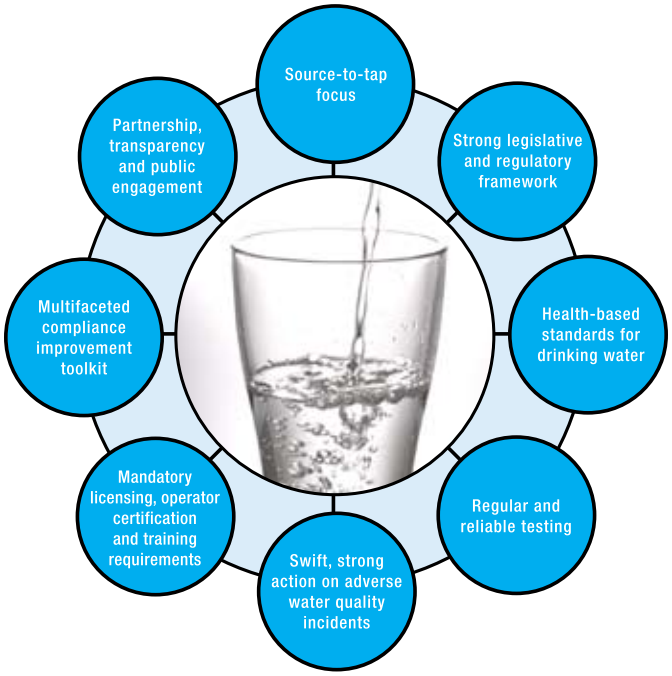
UNDERSTANDING YOUR RESPONSIBILITIES FOR OVERSEEING DRINKING WATER

Protecting Ontario's Drinking Water

Ontario has a comprehensive safety net to safeguard its drinking water from source to tap. It is a multi-faceted approach that helps prevent contamination, detects and solves water quality problems, enforces laws and regulations and increases people's awareness of the importance of safe, high quality drinking water.

Ontario's drinking water protection safety net has eight components:

- A source-to-tap focus
- A strong legislative and regulatory framework
- Regulated health-based standards for drinking water
- Regular and reliable testing
- Swift, strong action on adverse water quality incidents
- Mandatory licensing, operator certification and training requirements
- A multi-faceted compliance improvement tool kit
- Partnership, transparency and public engagement.



What is our Multi-Faceted Approach?

Our multi-faceted approach is an integrated system of procedures, processes and tools that collectively prevent or reduce the contamination of drinking water from source to consumer in order to reduce risks to public health.

The multiple barriers include:

- **Source protection** to keep the raw water as clean as possible in order to lower the risk that hazards are present.
- **Treatment** to remove and/or neutralize hazards.
- Maintenance of the integrity of the **distribution system** to prevent recontamination after treatment.
- **Monitoring programs** to detect and act on system problems that could impair drinking water safety and to verify the performance of the system components and finished drinking water quality.
- Effective **management systems** including automatic control systems, well-developed responses and operating practices that are the ultimate means for protecting the safety of drinking water systems.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

Peer to Peer

"As a Councillor, ensuring the best quality of drinking water for our community may be the most important thing we do." – Councillor Jack Miller, City of Belleville

A Legislative and Regulatory Framework for Protecting Water

Strong legislative and regulatory measures are key components of Ontario's drinking water safety net. This guide focuses on the Safe Drinking Water Act, 2002 (SDWA or the Act), which provides a legislative framework for all municipal drinking water systems, as well as some non-municipal systems. The SDWA provides a consistent set of province-wide standards and rules to ensure access to safe, high quality, reliable drinking water.

The Safe Drinking Water Act, 2002 – *An Overview*

The SDWA recognizes that the people of Ontario are entitled to expect their drinking water to be safe. It provides for the protection of human health and prevents drinking water health hazards through the control and regulation of drinking water systems and drinking water testing. In a municipal context, a drinking water system includes all treatment and distribution pipes up to customer property lines.

The SDWA and its associated regulations specify the requirements for drinking water systems, testing services, certification of system operators and drinking water quality analysts. It also sets quality standards and mechanisms for compliance and enforcement.

How the Pieces Fit Together

To learn more about how various Acts and Regulations create multiple safeguards to protect drinking water, read Conservation Ontario's brochure entitled "How Ontario's Drinking Water is Protected" at **www.conservation-ontario.on.ca/resources/Brochures/CWALegsandRegsBrochure.pdf**.

The Big Picture

There are approximately 700 municipal residential drinking water systems registered with the Ministry of the Environment (MOE) that supply drinking water to more than 80 per cent of the homes in Ontario. In recent testing, more than 650,000 drinking water test results were submitted to MOE by laboratories licensed to perform these tests. Over 99 per cent of these drinking water tests met the province's rigorous, health-based drinking water quality standards.

Key Sections of the SDWA for Municipal Councillors

Section 11: Duties of Owners and Operating Authorities

Section 11 of the SDWA describes the legal responsibilities of owners and operating authorities of regulated drinking water systems. It is important for you to understand the scope of your municipality or operating authority's day-to-day responsibilities.

Owners and operators are responsible for ensuring their drinking water systems:

- provide water that meets all prescribed drinking water quality standards
- operate in accordance with the Act and its regulations, and are kept in a fit state of repair
- are appropriately staffed and supervised by qualified persons
- comply with all sampling, testing and monitoring requirements
- meet all reporting requirements.

Examples of actions required of owners and operators under Section 11:

- Sampling and testing of drinking water with a frequency appropriate to the type and users of the system in accordance with the Act
- Using an accredited and licensed laboratory for drinking water testing services
- Reporting of adverse test results that exceed any of the standards in the Ontario Drinking Water Quality Standards Regulation, both verbally and in writing, to the local medical officer of health and MOE
- Obtaining a drinking water licence for a municipal residential drinking water system from the MOE, which includes a financial plan
- Ensuring the drinking water system is operated by an accredited operating authority
- Hiring certified operators or trained persons appropriate to the class of the system
- Preparing an annual report to inform the public on the state of the drinking water and the system providing it, and an annual summary report for the owners of the drinking water system.

Q&A

Who is the "owner" of a municipal drinking water system under the SDWA? Who is the "operator"?

The "owner" of a municipal drinking water system is often the municipality as a corporate entity. Members of municipal councils and municipal officials who provide oversight to this corporate entity also provide oversight or exercise decision-making authority in respect of the drinking water systems it owns. They are responsible for having policies, management tools and processes in place so that the municipality meets all its legislative and regulatory requirements under the SDWA.

The "operator" or operating authority of a municipal drinking water system is the person or entity that is given responsibility by the owner for the day-to-day operations of the drinking water system, its management, maintenance or alteration. A municipality may take on this operational role through its own staff or it may choose to contract it out to a third party.

Section 19: Your Duty and Liability – Statutory Standard of Care

> *"Given that the safety of drinking water is essential for public health, those who discharge the oversight responsibilities of the municipality should be held to a statutory standard of care."*
>
> — Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

This is one of the many important recommendations that came out of the Walkerton Inquiry reports in 2002. Section 19 of the SDWA responds directly to this recommendation.

Section 19 of the SDWA expressly extends legal responsibility to people with decision-making authority over municipal drinking water systems. It requires that they exercise the level of care, diligence and skill with regard to a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation and that they exercise this due diligence honestly, competently and with integrity.

Meeting your statutory standard of care responsibilities

Meeting the statutory standard of care is the responsibility of:

- the owner of the municipal drinking water system
- if the system is owned by a municipality, every person who oversees the accredited operating authority or exercises decision-making authority over the system – **potentially including but not limited to members of municipal councils**
- if the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation.

It is important that members of municipal council and municipal officials with decision-making authority over the drinking water system understand that they are personally liable, even if the drinking water system is operated by a corporate entity other than the municipality. Section 14 (3) of the SDWA specifically notes that an owner is not relieved of their duty to comply with Section 19, even if there is an agreement to delegate the operations of the drinking water system to someone else.

The owner is still obligated to:

- ensure the operating authority is carrying out its responsibilities according to the Act and,
- in cases where it is not, to take reasonable steps to ensure they do.

Examples of actions required of owners and operators under Section 14 (3):

- Being aware of the established procedure for communication with the operating authority, including how information is expected to be shared with municipal councillors, and assessing the effectiveness of this procedure.
- Holding regular meetings with the operating authority, especially in cases where there may be reason to believe the operating authority is not carrying out its responsibilities.

Since Ontario municipalities manage and govern municipal drinking water systems in a variety of ways, the people who are subject to the statutory standard of care within their corporation will also vary across the province, and would depend on specific facts related to individual situations.

Peer to Peer

"This guide makes it clear what our fiduciary and legal responsibilities are and provides the necessary questions to ask which allows us to become thoroughly knowledgeable on this aspect of our responsibilities. I encourage all elected and appointed officials to take the time to digest the information in this guide and put it to good use."

— Former Mayor Michael Power, Municipality of Greenstone and Past-President Association of Municipalities of Ontario

Complete wording of Section 19, Safe Drinking Water Act, 2002

19. (1) Each of the persons listed in subsection (2) shall,

(a) exercise the level of care, diligence and skill in respect of a municipal drinking-water system that a reasonably prudent person would be expected to exercise in a similar situation; and

(b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. 2002, c. 32, s. 19 (1).

Same

(2) The following are the persons listed for the purposes of subsection (1):

1. The owner of the municipal drinking water system.
2. If the municipal drinking-water system is owned by a corporation other than a municipality, every officer and director of the corporation.
3. If the system is owned by a municipality, every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system. 2002, c. 32, s. 19 (2).

Offence

(3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).

Same

(4) A person may be convicted of an offence under this section in respect of a municipal drinking-water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4).

Reliance on experts

(5) A person shall not be considered to have failed to carry out a duty described in subsection (1) in any circumstance in which the person relies in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report. 2002, c. 32, s. 19 (5).

Note: A proclamation has been issued naming January 1, 2013 as the day on which s.19 of this Act comes into force. For a copy of the Safe Drinking Water Act, 2002 and its related regulations, go to the Ontario e-laws website at **www.e-laws.gov.on.ca**.

Maintaining an Appropriate Level of Care

Standard of care is a well-known concept within Ontario legislation.

For example, the Business Corporations Act requires that every director and officer of a corporation act honestly and in good faith with a view to the best interests of the corporation and exercise the care, diligence and skill that a reasonably prudent person would in comparable circumstances.

Statutory standards of care address the need to provide diligent oversight. What is considered to be an appropriate level of care will vary from one situation to another. As a municipal councillor, it is important to educate yourself on this statutory requirement and to gain an understanding of the operation of drinking water systems in your community to help you meet the standard of care requirements.

You are not expected to be an expert in the areas of drinking water treatment and distribution. Section 19 allows for a person to rely in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report.

North Battleford: Council Decisions with Serious Consequences

In Spring 2001, nearly 6,000 residents of this Saskatchewan city of 13,000 fell victim to an outbreak of cryptosporidiosis, an illness caused by a parasite in human and animal waste, which entered the local drinking water supply. Symptoms included diarrhea, abdominal cramps, fever, nausea and headaches.

In an article on the subsequent Commission of Inquiry, the Canadian Environmental Law Association noted:

"… what became clear was that the people of North Battleford were let down. Their municipality, carrying a bulging contingency fund, refused to spend money on upgrading their decrepit water treatment plant. Their provincial government, although aware the plant was in poor condition, hadn't inspected it in the ten years prior to the outbreak… plant employees, who had been working without a supervisor for over four months, were unable to heed the warning signs of a potential drinking water problem."

The City of North Battleford subsequently faced class action lawsuits totaling millions of dollars. The first settlement was an out of court agreement awarding $3.2 million to some 700 claimants.

(Source: www.cela.ca and www.cbc.ca)

Enforcing the Statutory Standard of Care

As a municipal councillor, you need to be aware that not meeting your statutory standard of care responsibilities comes with serious consequences. Section 19 provides the province with an enforcement option when needed.

A provincial officer has the authority to lay a provincial offence charge against a person to whom the standard applies. The range of penalties includes maximum fines of up to $4 million for a first offence and provision for imprisonment for up to five years. No minimum penalties are established. Actual penalties would be decided by the courts depending on the severity and consequences of the offence.

It is important to note the difference between the provision of the Municipal Act, 2001, that limits the personal liability of members of municipal councils and officials, and the standard of care imposed under the SDWA. Under sections 448-450 of the Municipal Act, 2001, municipal council members and officials have relief from personal civil liability when they have acted in good faith. However, despite that protection, municipal councillors and officials that are subject to the duty imposed by Section 19 of the SDWA could be penalized if a prosecution is commenced and a court determines they have failed to carry out the duty imposed under that section.

Peer to Peer

"There is no greater responsibility imposed upon an elected municipal official than the diligent, conscientious oversight of a municipal water treatment or distribution system." – Councillor Ken Graham, Town of Smiths Falls

Peer to Peer

"As mayor, it is vitally important that the standard of care is put in place and that municipal elected officials are aware of their responsibilities in ensuring that the public has safe and secure drinking water." – Mayor Delbert Shewfelt, Town of Goderich

Some Questions and Answers on the SDWA Statutory Standard of Care

If drinking water operations are contracted out, am I still responsible for the statutory standard of care?
As an owner of a drinking water system, you remain responsible for meeting the statutory standard of care even though you have contracted out operations to an operating authority. (For more details see page 7 on Section 14 (3) of the SDWA.)

If something goes wrong, will I be held responsible?
The statutory standard of care related to drinking water is to ensure that decision-makers are doing their due diligence to protect public health when making decisions about drinking water systems. The circumstances and your actions - what you did or didn't do, what questions you asked, what steps were taken to address identified risks or problems with your drinking water system - will all be important in determining whether you met your statutory standard of care and if you should be held responsible.

What can happen to someone who breaches the statutory standard of care?
Justice O'Connor made it clear that the standard of care is all about ensuring responsible actions are taken to protect human health. Given the seriousness of this duty to your community, those whose actions fall below the standard of care, fail to protect the public and cause harm to human health could face significant penalties, including fines and imprisonment.

Who determines if the standard of care has been breached?
When an incident occurs that may constitute a breach of the statutory standard of care, the MOE will initiate a response that may include an investigation and gathering of evidence to determine if charges should be laid. In a case where charges are laid, it is up to the courts to determine if an offence has been committed and if penalties or fines will be imposed. This procedure is followed in any potentially serious breach of MOE statutes.

ACTIONS You Can Take To Be Better Informed

The following are some suggested actions you can take to be better informed about your drinking water oversight responsibilities. Look for more of these suggested action boxes in Section 3 of this guide. A summary list of all actions found in the guide has been compiled for your convenience on **page 33**.

- Review the reports of the Walkerton Inquiry, specifically sections related to municipal government (Chapter 7 in Report I, Chapters 10 and 11 in Report II). The reports are available online at **www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/**.
- Become further acquainted with drinking water legislation and regulations, available on the Ontario Government e-Laws website at **www.e-laws.gov.on.ca**. Search or browse current consolidated law to find what you are looking for. To search, enter the title, or any part of the title, of the law you wish to find (for example, "Safe Drinking Water Act", "Ontario Water Resources Act" or "Clean Water Act"). If you don't know any part of the title of the law, enter a word or phrase that you think might be in the text of the law.
- Learn about drinking water safety and its link to public health. Speak to water system and public health staff to learn more.
- Become familiar with your municipal drinking water system. Ask your water manager to give a presentation to council and/or arrange a tour of your drinking water facilities.

CHECK YOUR KNOWLEDGE

Ask yourself these questions to check your current level of knowledge about your drinking water system and oversight responsibilities.

- ☐ Have I had a tour of our drinking water facility?
- ☐ Am I familiar with our municipal drinking water systems including:
  - a. the water source?
  - b. the physical condition of major infrastructure?
  - c. the background and experience of senior staff?, and
  - d. the approvals that have been granted for ownership and operation of the facilities?
- ☐ Am I acquainted with the drinking water legislation and regulations?
- ☐ Do I know basic information about drinking water safety and the operation of water works facilities?
- ☐ Do I understand the requirement to meet minimum standards for drinking water?
- ☐ Do I know how to set the overall policy direction for the municipal drinking water system?
- ☐ Do I understand the different roles and responsibilities of those who have decision-making authority – municipal councillors, senior management, other municipal officials?
- ☐ Am I assured that competent senior management has been hired? Do they conduct regular performance appraisals of staff?
- ☐ What were the results of our last inspection? Are there areas for improvement?
- ☐ Am I aware of the risks currently facing our water sources, drinking water facilities and infrastructure? What are the plans to address these risks?
- ☐ If there is an emergency with the drinking water system, what procedures are followed? How will I be notified? How will the public be notified?
- ☐ Am I aware of the municipal role in source protection planning?
- ☐ How and when do I ask for annual reports on the drinking water system from senior management?
- ☐ What should I look for in the annual report? What questions must it answer?
- ☐ What should I do if a report identifies declining water quality?
- ☐ Do I know that appropriate steps are being taken to resolve any issues? Do I know when outside expertise is needed?
- ☐ Are our drinking water systems periodically audited? When? How often? What should I do when I receive audit results for consideration?
- ☐ Do I know if our drinking water systems are financially sustainable for the future? Are there financial plans in place?
- ☐ Am I familiar with our municipal drinking water licence and the key elements of the licence (e.g. drinking water works permit, operational plan, financial plan, etc.)?

If you can't answer any of these questions, review them with municipal staff.

Training on a variety of drinking water topics is also available through the Walkerton Clean Water Centre. Visit the Centre's website at **www.wcwc.ca** to view its course catalogue.

WHAT SHOULD I BE ASKING?

When decisions come before your council relating to drinking water, you want to understand the impacts on your community and public health. While every situation will be different, the following are some preliminary questions you might want to ask:

- ☐ What are the risks to public health?
- ☐ Are there any areas of risk that council needs to address?
- ☐ What checks and balances are in place to ensure the continued safety of our drinking water?
- ☐ Are we meeting our legislative and regulatory requirements?
- ☐ What is the public health impact or long-term cost of deferring this decision?
- ☐ Will this decision affect our drinking water sources?
- ☐ How will this decision impact our community's demand for water?
- ☐ How are we managing our drinking water infrastructure? Is our infrastructure sustainable for future generations?
- ☐ Are there any emerging issues related to our drinking water that council should be aware of?
- ☐ What is the emergency management plan for a negative drinking water event? What is the role of council in a drinking water emergency?
- ☐ Have staff taken required training and upgrading?

Be informed. Ask questions. Get answers.

It's your duty.

OVERVIEW OF DRINKING WATER MANAGEMENT TOPICS

Organizational and Governance Models

Many different management and operating models are available for municipal consideration. Currently, most water services in Ontario are provided through municipal departments, with oversight provided directly by municipal councils.

Some municipalities hire external contractors to operate their drinking water system, whereas others own and operate their systems.

Regional municipalities have upper-tier and lower-tier governance structures, with the lower-tier municipality often owning and operating their own drinking water systems. There are also models for area water systems in Ontario in which systems cross municipal boundaries. These systems are governed by boards representing their municipal owners.

Municipalities may also create:

- Municipal Service Boards whose members are appointed by council and could include council members, private citizens or both
- Municipally-owned corporate water utilities, similar to those for natural gas or electricity distribution.

> *"The purpose of the quality management approach in the context of drinking water is to protect public health by achieving consistent good practice in managing and operating a water system."*
>
> *"It is fundamental for municipalities to have a management and operating structure for their water system that enables them to provide safe water. I am making two important recommendations to assist in this regard. First, I recommend that municipalities be required to have an agency…to operate their systems. The agency should be accredited…The municipality must also submit an operational plan to the (Ministry of the Environment) for their water system(s). Second, I recommend that those responsible for exercising the municipality's oversight responsibilities be held to a statutory standard duty of care. I note that, for municipalities, the first recommendation will be a significant step in satisfying the second."*
>
> — Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

Municipal Licensing: *Tools that can help you*

In Ontario, all municipal drinking water systems that provide water to residences in a community must have a licence from MOE. The ministry's Municipal Drinking Water Licensing Program requires owners and operators of drinking water systems to incorporate the concepts of quality management into system operation and management.

For a drinking water system to receive its licence, the owner and operator must have in place:

- a drinking water works permit
- an accepted operational plan (see next section for more details)
- an accredited operating authority
- a financial plan, and
- a permit to take water.

The Operational Plan and You – *Setting an Overall Policy*

The **operational plan** sets out a framework to develop a Quality Management System (QMS) that is specific and relevant to your drinking water system.

Part of your drinking water system's operational plan will document a QMS policy. This policy is the backbone of the quality management system. The policy must include commitments to:

- the maintenance and continual improvement of the QMS
- the consumer to provide safe drinking water, and
- comply with applicable legislation and regulations.

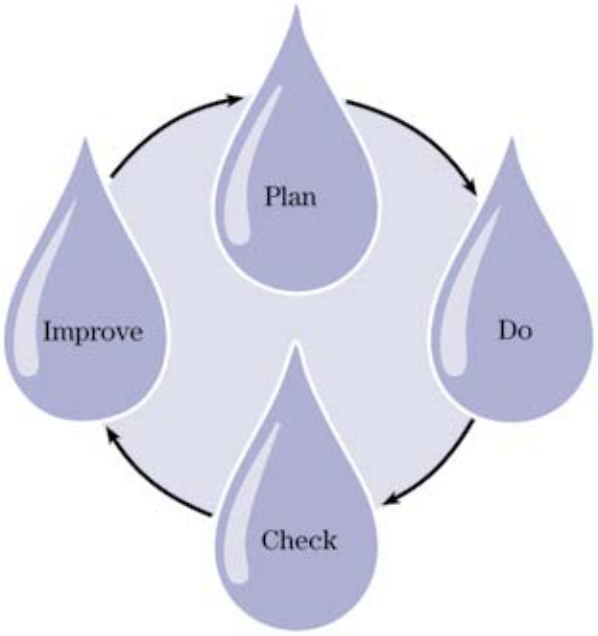
Your operating authority must get the owner's written endorsement of the drinking water system's operational plan, including this policy. As a municipal councillor, your council (as the owner's representative) may be asked to endorse the policy and its commitments. If your municipality has already completed this policy endorsement step, obtain a copy from your municipal staff.

In addition to the QMS policy, the operational plan will also include:

- basic key information about every drinking water system your municipality owns
- a process for ongoing **risk assessment**
- a description of organizational structures (roles, responsibilities, authority)
- a procedure for an annual review of the adequacy of the **infrastructure** needed to operate and maintain the drinking water system, plus a commitment for the operating authority to **communicate review findings** to you
- a procedure for sharing sampling, testing and monitoring reports about the safety of your drinking water
- an outline of the system owner's responsibilities during **emergency situations**
- a commitment to **continual improvement** through **corrective action**
- a procedure for conducting a management review every 12 months which evaluates the suitability, adequacy and effectiveness of the QMS against the requirements of the Drinking Water Quality Management Standard (**DWQMS**) and how to report the results of this review, including identified deficiencies, and decision and action items.

The DWQMS is the standard upon which drinking water system operational plans are developed and operating authorities are accredited. The requirements of the DWQMS, when implemented, will assist owners and operators of municipal drinking water systems to develop sound operational procedures and controls. Additional information on the **bolded** elements of the DWQMS listed above can be found further in this section of the guide.

Drinking Water Quality Management Standard (DWQMS)



The DWQMS is based on a PLAN, DO, CHECK and IMPROVE methodology which is similar to that found in some international standards. PLAN requirements of the standard typically specify policies and procedures that must be documented in the operational plans for the drinking water system, while DO requirements specify that the policies and procedures must be implemented. CHECK and IMPROVE requirements of the standard are reflected in the requirements to conduct internal audits and management reviews.

Example of a QMS Policy

The following is an example of a QMS policy for the Westhill Water Supply and Distribution System:

The Municipality of the Town of Westhill owns, maintains and operates the Westhill Water Supply and Distribution System.

The Town of Westhill is committed to:
1. ensuring a consistent supply of safe, high quality drinking water
2. maintaining and continuously improving its quality management system, and
3. meeting or surpassing applicable regulations and legislation.

The Municipality of Westhill
June 1, 2006

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

ACTIONS You Can Take To Be Better Informed

- Ask your operating authority to speak to your municipal council about your operational plan.
- Consider and act on any advice (including deficiencies and action items) identified during the annual management review process.
- Review the QMS policy in your operational plan and its commitments.
- Ask your operating authority to show how it is meeting these commitments.

DEFINITIONS

CONTINUAL IMPROVEMENT is understanding what you already do well, and then finding ways to do it better.

CORRECTIVE ACTION is a method of improvement, and the solutions that are generated by those actions are also inputs to continual improvement.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

Managing the Risks to Drinking Water

By performing a risk assessment, your operating authority will assess:

- existing or potential hazardous events facing your drinking water system, e.g. rail car derailment, algal blooms, water main breaks, etc.
- the impacts on drinking water if a hazardous event occurs, e.g. chemical contamination of source water, biological/chemical contamination of source water, possible biological/chemical contamination due to loss of supply/low pressure, etc.
- the necessary measures or response measures for each hazardous event (these measures may already be in place through such barriers as source protection or treatment processes), and
- ranking of each event according to its likelihood of occurring and the consequences or severity of the results.

In some cases, the operating authority may identify measures to address hazardous events which will call for improvements that require long-term planning. These types of decisions will often involve council approval. As a councillor, you should take time to understand the underlying risks associated with these decisions, their potential likelihood and impacts to public health.

In other cases, the operating authority may identify risks that are outside of their control. For these, it may be appropriate to develop contingency or emergency response procedures (see Emergency Planning for Drinking Water for more details on **page 22**).

DEFINITIONS

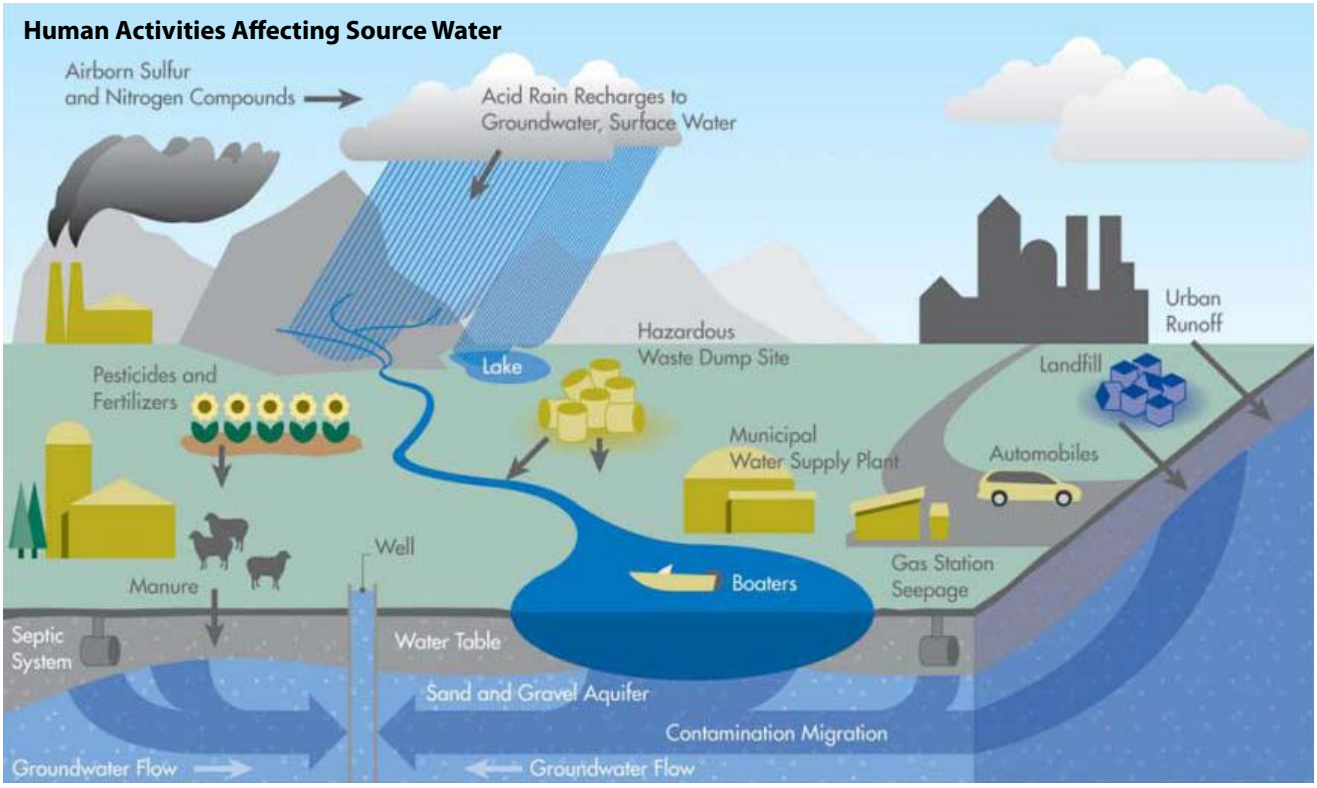
A **RISK ASSESSMENT** is an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

RISK is the probability of identified hazards causing harm, including the magnitude of that harm or the consequences.

A **HAZARD** is a source of danger or a property that may cause drinking water to be unsafe for human consumption.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

Human Activities Affecting Source Water



(Source: Pollution Probe, 2006, The Source Water Protection Primer)

Peer to Peer

"Never take the quality of our drinking water for granted. There are too many factors that can turn good water into bad." – Councillor Jack Miller, City of Belleville

More on Hazardous Events and Hazards to Drinking Water

Hazardous events can be natural or technological in origin, or result from human activities. Natural events include floods, ice storms, drought and spring run-off. Technological events could include equipment failure or a power outage. Human activities that could lead to a drinking water risk include vandalism, terrorism, chemical spills and construction accidents.

The four different types of hazards that may affect drinking water are biological, chemical, physical and radiological:

Biological Hazards:

- include bacterial, viral and parasitic organisms, such as E.coli, Giardia and Cryptosporidium
- are considered the most significant drinking water health risk because effects are acute; can cause illness within hours
- are commonly associated with fecal wastes from humans or animals, or occur naturally in the environment.

Chemical Hazards:

- include toxic spills, heavy metals, dissolved gases like radon, pesticides, nitrates, sodium, and lead
- can come from source water or occur in the treatment and distribution system.

Physical Hazards:

- include sediments that can carry microbiological hazards and interfere with disinfection process, biofilms and pipe materials
- can result from contamination and/or poor procedures at different points in the delivery of water to the consumer.

Radiological Hazards:

- are naturally occurring chemicals such as radon or uranium; most frequently occur in groundwater
- may arise from man-made or natural sources.

Peer to Peer

"Adequate municipal funding is a key component of risk management."
– Councillor Ken Graham, Town of Smiths Falls

Infrastructure Planning

Having a sound drinking water infrastructure is necessary to meet the demand for safe drinking water. Machinery, equipment and structures used to produce and provide safe drinking water must be in place, maintained and improved when necessary.

Your operating authority is required to:

- document a procedure for conducting an annual review of your drinking water system's infrastructure
- provide a summary of the programs in place to maintain, rehabilitate and review that infrastructure
- report their findings after the review to the owner, and
- monitor the effectiveness of its maintenance program.

Depending on the structure of - and relationship between - the owner and operating authority, the results of the annual review can be communicated through such means as council, budget, planning or other management meetings.

Maintenance activities can be either planned or unplanned:

- Planned maintenance includes scheduled or proactive activities needed to maintain or improve infrastructure elements, e.g. equipment maintenance, main replacements, etc. They are done to reduce the risk of an unplanned failure.
- Unplanned maintenance includes reactive activities, e.g. to deal with main breaks, pump failures, etc. They can draw heavily on resources and adversely affect drinking water quality.

By establishing planned programs for maintenance, rehabilitation and renewal, the operating authority can save time and costs and increase public confidence in drinking water.

Some drinking water systems have five or 10-year rolling plans to address such considerations as main rehabilitation, upgrades and replacement, water treatment and storage due to increased projected demands. These types of system maintenance requirements are usually tied to the capital budgets of the operating authority and/or the owner of the drinking water system.

ACTIONS You Can Take To Be Better Informed

- Find out what maintenance, rehabilitation and renewal plans are in place for your drinking water system.
- Ask your operating authority to present the findings of its annual infrastructure review.

Scope of Assets

It's estimated that Ontario will require $30 to $40 billion of investment in water infrastructure repairs and upgrades over the next 15 years. Water efficiency measures can be used to extend the capacity of existing infrastructure and defer upgrading costs.

(Source: Ontario Ministry of the Environment and the Ontario Ministry of Natural Resources, 2009, Safeguarding and Sustaining Ontario's Water Resources for Future Generations)

DEFINITIONS

INFRASTRUCTURE – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including buildings, workspaces, process equipment, hardware and software, and supporting services such as transport or communications.

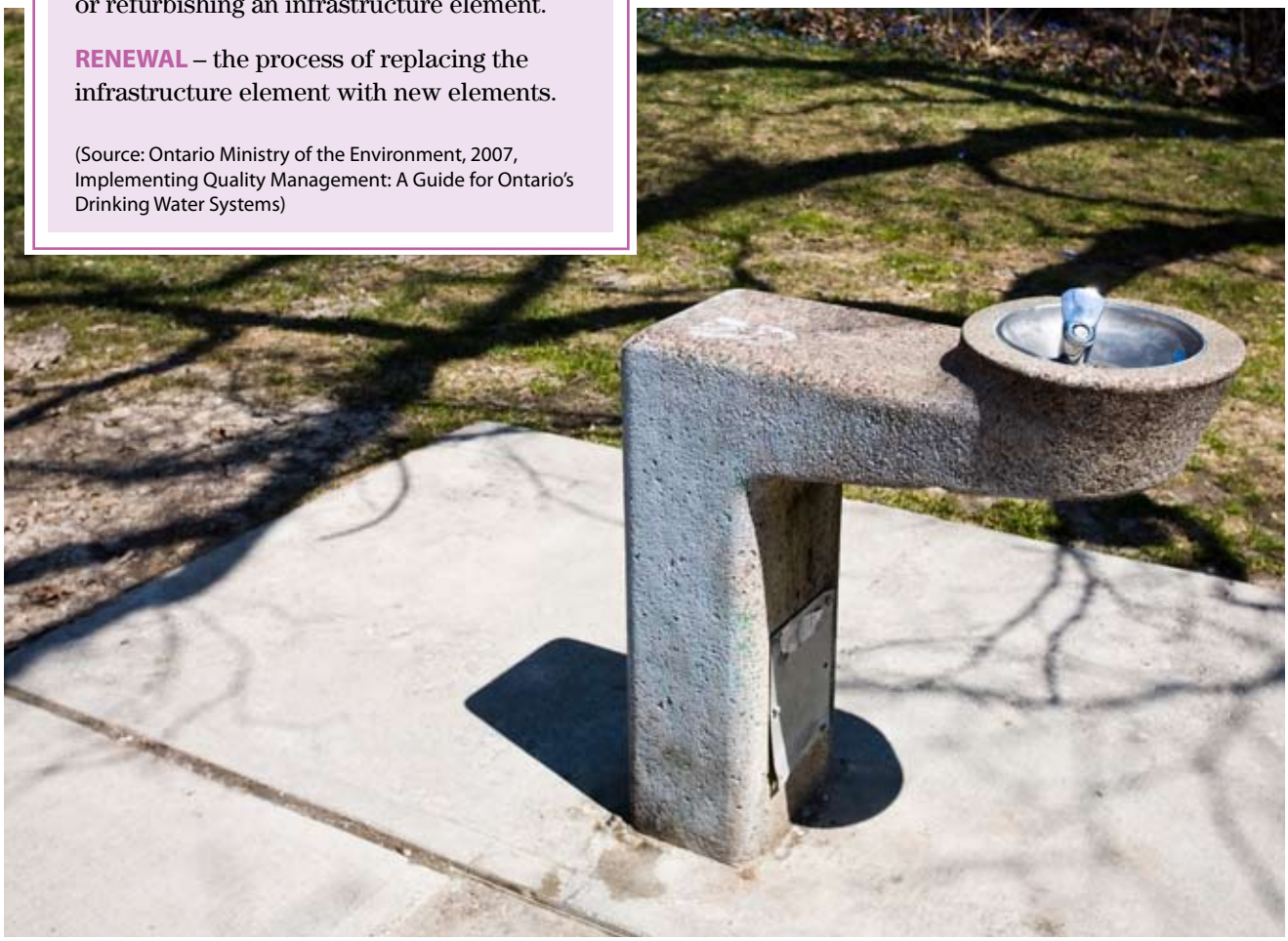
REHABILITATION – the process of repairing or refurbishing an infrastructure element.

RENEWAL – the process of replacing the infrastructure element with new elements.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

Peer to Peer

"Aging infrastructure is the major challenge facing municipalities today, and a solid long-term plan to address this is a must."
– Councillor Paul Hubert, City of London



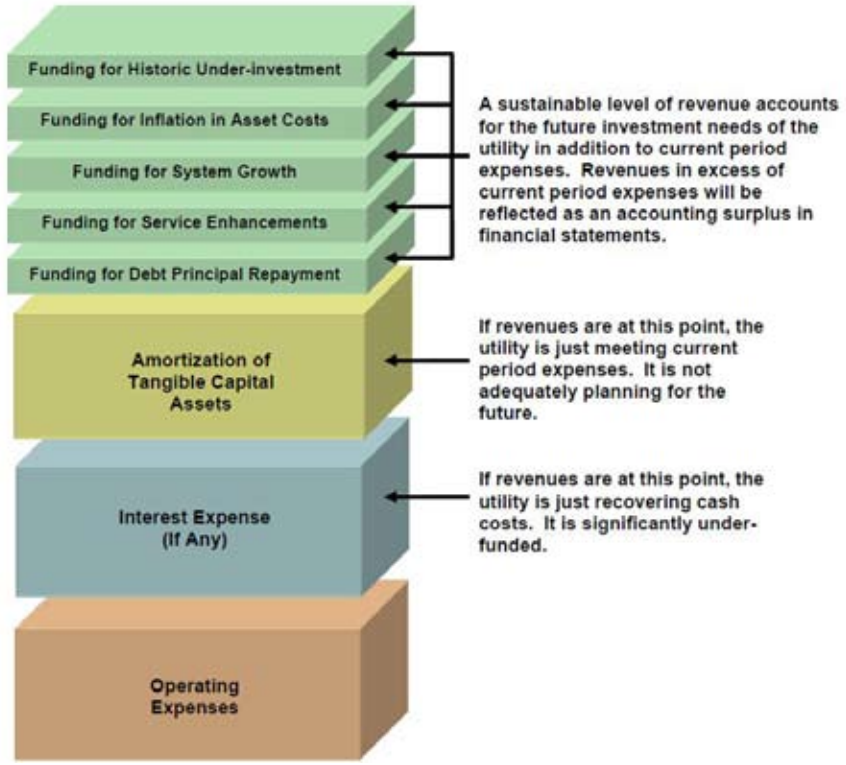
Sustainable Financial Planning for Drinking Water Systems

Achieving financial sustainability in Ontario's municipal water and wastewater is a long-term goal. Financial sustainability is needed to ensure that Ontarians continue to enjoy clean and safe drinking water, water and wastewater services are reliable and environmental protection is maintained.

To receive a municipal drinking water licence for your drinking water system, your municipality needs to prepare a financial plan.

You have an important role to play in ensuring that appropriate resources are made available to ensure that a financial plan can be prepared. Municipal councils have ultimate responsibility for approving financial plans that are prepared for a water utility.

A Building-block Approach to Determining Utility Needs



(Source: Ontario Ministry of the Environment, 2007, Towards Financially Sustainable Drinking-Water and Wastewater Systems)

The following are some key principles for developing a financial plan.

- Ongoing public engagement and transparency can build support for - and confidence in - the financial plan and the drinking water system.
- An integrated approach to planning among water, wastewater and storm water systems is desirable given the inherent relationship among these services.
- Revenues collected to provide water and wastewater services should ultimately be used to meet the needs of those services.
- Life-cycle planning with mid-course corrections is preferable to planning over the short-term or not planning at all.
- An asset management plan is a key input to the development of a financial plan.

> *"Municipalities need to ensure that their water systems are adequately financed. Over the long term, safety depends on stable and adequate financing to maintain the water system's infrastructure and its operational capacity to supply high-quality water consistently."*
>
> — Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

- Financial plans benefit from the close collaboration of various groups including engineers, accountants, auditors, utility staff and municipal council.

Water Audits and Accounting for Water Losses

An important tool in understanding the condition of your drinking water system assets is a water audit. This is the process of estimating where all of the water entering the distribution system ends up. One of the things a water audit will reveal is how much water is being lost to leaks from water mains and service connections. Leaks are a concern as they can:

- signal deteriorating water main conditions and be a precursor to more breakages
- be a source of bacterial contamination
- result in additional costs for pumping and treating water that is not ultimately delivered to consumers, and
- damage other infrastructure such as roads and sewers.

(Source: Ontario Ministry of the Environment, 2007, Towards Financially Sustainable Drinking-Water and Wastewater Systems)

Financial plans for drinking water systems are required to forecast costs over a minimum period of six years, although municipalities are encouraged to adopt a life-cycle approach to managing their drinking water assets as a long-term goal. Financial plans are living documents and should be updated and reviewed as new information becomes available. As a best practice, they should be updated annually to foster continuous improvement and rolled into the annual municipal budget process.

There are many different costs, both capital and operating, associated with planning, building and operating water systems. Some costs reflect outputs not attributable to the provision of water such as fire protection services, or the operation of combined storm and sanitary sewer systems.

A sustainable system is one that can adequately cover current operating costs, maintain and repair its existing asset base, replace assets when appropriate, fund future growth and enhancements to services, and account for inflation and changes in technology.

The Big Picture

According to Environment Canada, 12 per cent of water produced at municipal water treatment facilities in Ontario is lost, mainly due to leaks in the distribution system infrastructure. Others sources estimate this figure is as high as 30 to 40 per cent.

(Sources: Environment Canada, 2010, 2010 Municipal Water Use Report: 2006 Statistics; The Undergrounder magazine, April 2010)

Communicating With Your Operating Authority

Within the operational plan, your operating authority is required to have a procedure for communicating with the owner of the drinking water system, its personnel, suppliers and the public. You should be familiar with how communication about drinking water takes place. The procedure for communicating with the owner may be as simple as indicating the status of the implementation of the QMS and its effectiveness during scheduled meetings, such as council meetings. Communication with the public may include posting information on a publicly accessible website or through billing inserts.

As noted previously, your council may be asked to provide a written endorsement of the system's operational plan. Depending on the nature of your system's management structure, the operating authority may also involve the owner in other areas of the QMS such as risk assessment, management review or infrastructure.

ACTIONS You Can Take To Be Better Informed

- Determine when and how your operating authority will communicate to you as an owner.
- Find out what information is made available to the public and how.

Emergency Planning for Drinking Water

Under the Emergency Management and Civil Protection Act, your municipality will already have an Emergency Response Plan for a wide range of potential scenarios. Some of these scenarios may involve drinking water and may link to planning done as part of the QMS to document procedures to maintain a state of emergency preparedness.

Emergency preparedness means identifying what could happen in your system to cause an emergency and having processes and procedures in place to prepare for and respond to those emergencies. Some elements of an emergency response plan include communications, training, testing, responsibilities and contact information.

In a drinking water context, emergencies can happen as the result of a variety of natural and human-caused events such as severe weather, major power outages, spills, pandemics and deliberate acts of vandalism or terrorism. Potential emergencies can be identified through risk assessments, MOE inspections, corporate audits, insurance company reviews, and records of past emergencies.

DEFINITIONS

A **DRINKING WATER EMERGENCY** is a potential situation or service interruption that may result in the loss of the ability to maintain a safe supply of drinking water to consumers.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

ACTIONS You Can Take To Be Better Informed

- Ask your operating authority to review the drinking water emergency plan with council and to explain what responsibilities have been assigned to the owner.
- Know who will be the spokesperson during a drinking water emergency.
- Ensure critical staff have taken necessary training on emergency procedures and have participated in testing.

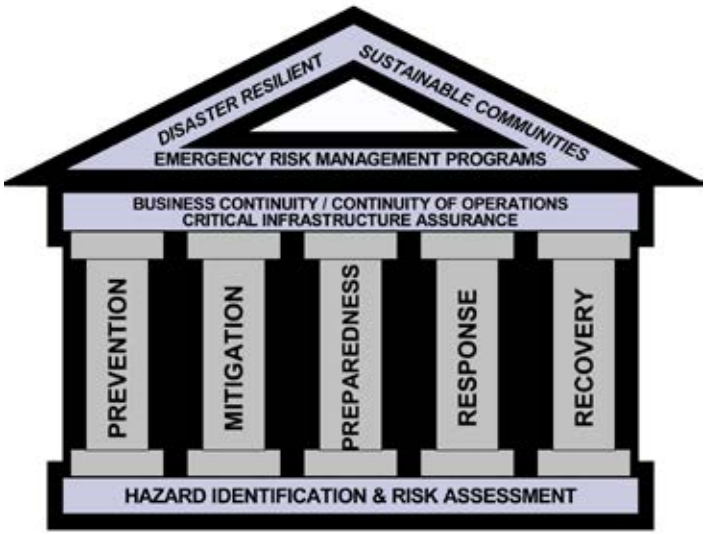
An element of the QMS emergency procedures is to clearly document the roles and responsibilities of the owner and operating authority during each emergency. For example, in an emergency, your Clerk-Treasurer may be assigned the responsibility of seeking resource authorization from council and act as chief liaison with council and the mayor.

The QMS also requires that clear direction for communicating to the owner and others during an emergency be established. Planning beforehand how those in charge will talk to each other and the media can avoid complications during an emergency.

Preparing also means training and testing. The best emergency response procedures are ineffective if personnel are not properly trained on what to do and the procedures tested. All personnel working within the drinking water system need to know what to do in an emergency, especially those with special response roles. Common forms of testing and training include orientation and education sessions, table-top exercises, walk-through drills, functional drills or full-scale exercises.

Five pillars of emergency management

Emergency management includes organized and comprehensive programs and activities taken to deal with actual or potential emergencies or disasters. It is based on a risk management approach and includes activities in five components: prevention, mitigation, preparedness, response, and recovery. These components are illustrated in the following figure:



(Source: Emergency Management Ontario, 2010, Emergency Management Doctrine for Ontario)

Adverse Drinking Water Incident, Boil Water Advisory and Drinking Water Advisory - How are they different?

An adverse water quality incident (AWQI) indicates that a drinking water standard has been exceeded or a problem has arisen within a drinking water system. AWQIs are an important component of the drinking water safety net. The report of an AWQI does not in itself indicate that drinking water is unsafe or that the statutory standard of care has not been met, but rather that an incident has occurred and corrective actions must be taken to protect the public. In some cases, these corrective actions may include a boil water advisory (BWA) or a drinking water advisory (DWA).

The local Medical Officer of Health in each of Ontario's 36 public health units is responsible for issuing BWAs and DWAs when necessary.

A BWA is issued when a condition exists with a drinking water supply that may result in a health risk and the condition can be corrected by boiling the water or by disinfection. An example is the presence of bacteria in the water supply such as E. coli.

A DWA is issued when a condition exists with a drinking water supply that cannot be corrected by boiling the water or by disinfection. An example is the presence of chemical contaminants.

In both cases, the local Medical Officer of Health will direct the system owner to inform users of the advisory, through means such as door-to-door notification, public posting of notices and local media outlets, to boil water and/or use an alternate water supply until further notice. An advisory will be lifted only after the local Medical Officer of Health is satisfied that corrective actions were taken and the situation is remedied.

Drinking Water System Reports and Inspections: *What they tell you about your drinking water system*

An owner of a drinking water system is required to ensure that an annual summary report is presented to the members of council or local services board. Summary reports must be produced by March 31 of each year to cover the preceding calendar year.

The summary report must include:

- information about any requirements of the SDWA, the regulations, the system's approval, drinking water works permit, municipal drinking water licence and any order that the system failed to meet during the time period, plus the duration of the failure
- a description of the measures taken to correct each failure
- a comparison of the system's capability with the quantities and flow rates of the water supplied the preceding year to help assess existing and planned uses.

Municipalities are also required to provide details about each residential drinking water system in an annual report to consumers. This annual report must be completed by February 28 each year and include:

- a brief description of the drinking water system including chemicals used
- a summary of the results of required testing, plus the approval, licence or provincial officer order issued to the system
- a summary of any adverse test results required to be reported to the Ministry of the Environment
- a description of any corrective actions taken, and
- a description of any major expenses incurred to install, repair or replace required equipment.

Every municipal residential drinking water system is inspected at least once a year by the Ministry of the Environment. An inspection includes the review of a system's source, treatment and distribution components, as well as water quality monitoring procedures and practices to evaluate system management and operations.

ACTIONS You Can Take To Be Better Informed

- Obtain and thoroughly review copies of the most recent annual and summary reports.
- Ask for explanations of any information you don't understand.
- Consider, act on and correct any deficiencies noted in the reports.

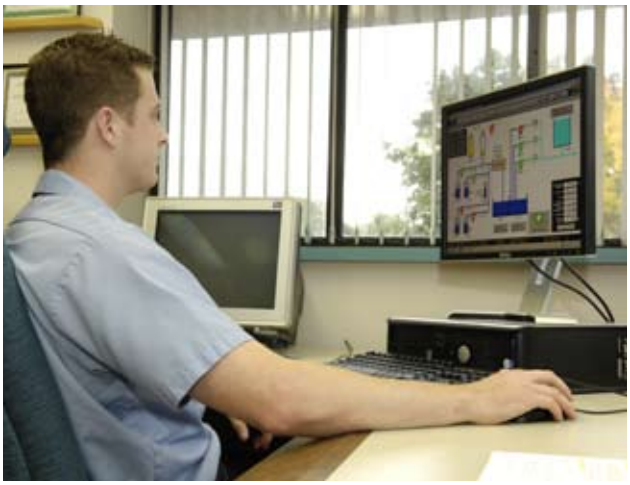
MOE prepares an inspection report that highlights any areas of non-compliance and what actions are required to correct them. The report also includes an inspection rating to help you compare your system's current and past performance, and identify areas for improvement.

ACTIONS You Can Take To Be Better Informed

- Review your annual inspection results and ask questions if there is any indication of declining quality.
- Clarify any technical terms.
- Ask how deficiencies are being addressed.
- Review your system's standing in the ratings reported in the Chief Drinking Water Inspector's Annual Report. If your rating is less than 100 per cent, ask why.
- Consider, act on and correct any deficiencies highlighted in the inspection.

Drinking Water System Operators:
What do they do? What certification requirements must they meet? Why do you need to plan?

Ontario has established requirements for the training and certification of drinking water (and wastewater) system operators. Municipal residential drinking water systems are required to use certified operators to perform all operational work.



Drinking water system operators play a vital operational role in providing safe drinking water to your community. The responsibilities of an operator may include:

- Checking, adjusting and operating equipment such as pumps, meters, analyzers, and electrical systems, and having replacement parts on-site for critical repairs
- Determining chemical dosages and keeping chemical feed equipment appropriately filled with chemicals, adjusted and operating properly
- Ordering and maintaining a stock of parts, chemicals and supplies
- Maintaining operating records and submitting operating reports to the system's operating authority/owner and the province
- Collecting and submitting water samples as required by regulation (This usually involves taking samples from a number of key locations and transporting them to a licensed laboratory.)
- Explaining and recommending to the operating authority/owner any major repairs, replacements or improvements that should be made to the plant.

ACTIONS You Can Take To Be Better Informed

- Ensure there are sufficient resources for appropriate levels of training for municipal staff involved in operating a drinking water system.
- Confirm that an overall responsible operator (ORO) has been designated and that procedures are in place to ensure all required staff and contractors are certified.
- Check to see if drinking water operator succession planning is being done.

Types of Drinking Water System Operators

Overall Responsible Operator (ORO) - designated by the owner or operating authority, the ORO has overall operational responsibility for the system and must have an operator's certificate to match the classification of the facility.

Operator-in-Charge (OIC) - designated by the owner or operating authority, the OIC can direct other operators, set operational parameters in the system and has the authority to make operational decisions.

Operators - all persons who adjust processes, equipment or the flow, pressure or quality of water in the system. Operators must hold a valid operator's certificate or work under the direct on-site supervision of a certified operator.

Operator-in-Training (OIT) - new operators who can operate a drinking water system. They cannot be designated as an ORO or OIC.

The operational complexity of your drinking water system will determine what certification requirements your operators must have to operate the system. Certification requires applicants to meet requirements in education, training, experience and knowledge and pass required exams. A certificate is valid for three years. To renew a certificate, operators must complete 20 to 50 hours of mandatory training per year on subjects related to the duties of a water system operator. Continuing education helps operators steadily improve their knowledge and skills throughout their careers.

Peer to Peer

"Competent, certified operators are a key element to due diligence. Municipalities have an obligation to facilitate ongoing training for water treatment operators."

– Councillor Ken Graham, Town of Smiths Falls

Water Conservation

Creating and implementing water conservation measures help to reduce water and energy consumption, lower long-term infrastructure costs and protect the environment.

It is estimated that every additional litre of water capacity costs roughly four dollars for expanded water and wastewater infrastructure. Many municipalities in Ontario are realizing significant savings from water conservation measures.

The cost of energy to pump, distribute and treat water and wastewater is a significant expense for most Ontario municipalities. Saving water saves energy and reduces greenhouse gas emissions. Better water management has the potential to be one of the most cost-effective energy reduction strategies for Ontario's municipalities.

(Source: Ontario Ministry of the Environment and the Ontario Ministry of Natural Resources, 2009, Safeguarding and Sustaining Ontario's Water Resources for Future Generations)

Peer to Peer

"Water is our most valuable natural resource. How we as councillors protect that resource will become more and more important as we continue to require safe drinking water in the future."

– Councillor-at-Large Rebecca Johnson, City of Thunder Bay

Water Conservation Facts

- Ontarians currently use about 267 litres of water per capita per day, which is nearly twice as much as other countries with similar standards of living such as Germany, the United Kingdom and the Netherlands.
- Pumping and distributing water to homes and businesses, and treating water and wastewater makes up one-third to one-half of a municipal government's total electrical use, which is double that of other municipal costs such as street lighting.
- Canadian surveys have consistently shown that as the percentage of metered homes in a community increases, water use per capita decreases. In municipalities that use volume-based water charges (i.e. meters), the average daily consumption is 263 litres per person, while in municipalities that charge a flat or assessed rate, the corresponding figure is 76 per cent higher, or 464 litres per person.

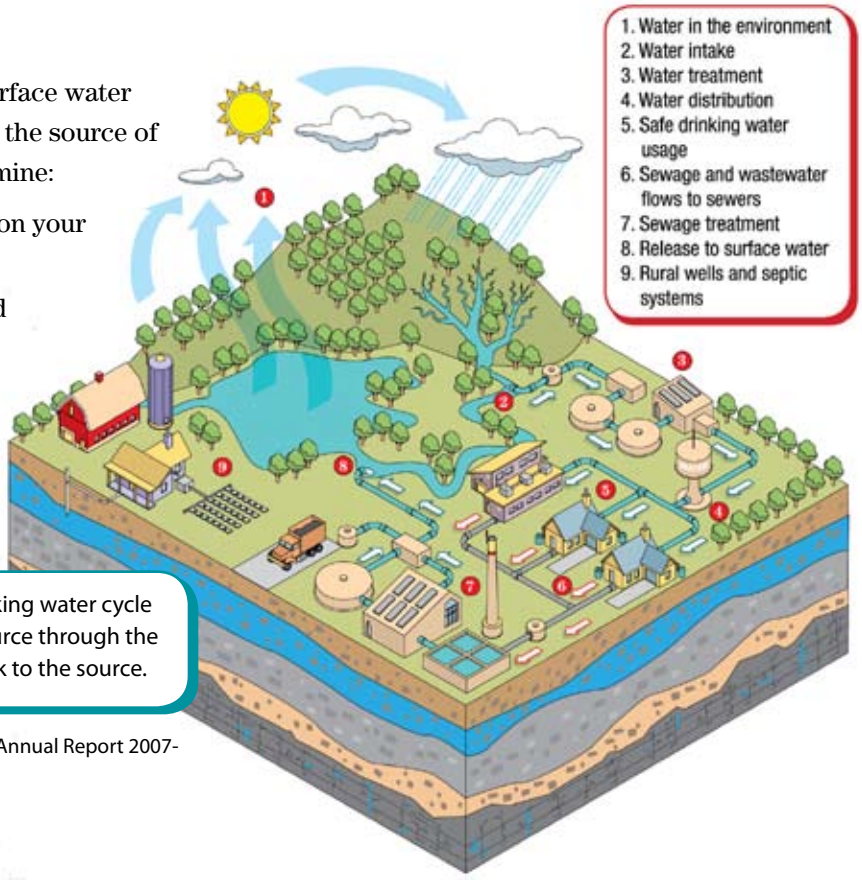
(Source: Environment Canada, 2010, 2010 Municipal Water Use Report: 2006 Statistics)

LEARN MORE ABOUT DRINKING WATER

Sources of Water

Ontario's drinking water comes from surface water or groundwater. It is important to know the source of your community's water as it will determine:

- the kind of treatment and disinfection your drinking water system must have
- the equipment needed to access and distribute your water
- the types of risks your drinking water may face, and
- planning for your water supplies for the future.



Right: A graphical representation of the drinking water cycle demonstrating how water flows from the source through the water treatment process to your tap and back to the source.

(Source: Ontario Ministry of the Environment, 2009, Annual Report 2007-2008 Chief Drinking Water Inspector)

Surface water

Surface water for public use is taken from rivers, lakes or reservoirs which are replenished by rain and snow. Surface water is more susceptible to contamination for the following reasons:

- **Rivers** – may flow through farmland, industrial areas, sewage discharge zones and other districts which may cause harmful contamination and/or affect taste, odour, clarity and colour. River water quality will vary throughout the year.
- **Lakes and reservoirs** – usually have better water quality than rivers. Suspended contaminants will 'settle out' in lakes. However, lakes and reservoirs are subject to plant and algae growth, which can give lake water unpleasant taste or odour. Human activities (power boats, feed-lots, etc.) are also a threat. In addition, lakes are often fed by rivers which carry contaminants.

The Great Lakes and Drinking Water

Ontario borders on the Great Lakes, which store about 95 per cent of North America's supply of fresh water and about one-fifth of the world's supply of fresh surface water. Only one per cent of this water is renewed each year by rain and snowfall. More than 70 per cent of Ontarians get their drinking water from the Great Lakes.

Groundwater

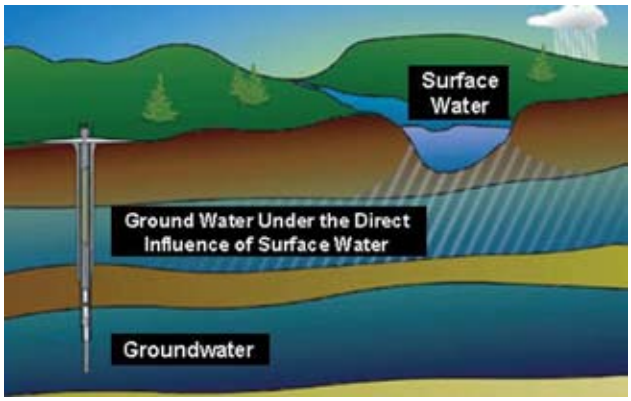
Groundwater (defined as 'water that occurs beneath the surface of the Earth') can be found in most parts of Ontario. It gathers in aquifers, the layers of sand, gravel and rock through which water seeps from the surface.

Sand and gravel aquifers are usually the most suitable for public water systems because water is more plentiful. Among rock aquifers, sandstone is often porous and can be a good source of groundwater. Limestone is not porous but may have cracks and cavities through which water can move and also provide a water supply.

Groundwater Under Direct Influence - GUDI

In addition to groundwater and surface water, there is a third source of water known as GUDI which stands for Groundwater Under Direct Influence of Surface Water.

An aquifer supplied by GUDI is viewed in the same category as surface water and has the same treatment and disinfection requirements.



(Source: Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials)

Source Protection in Ontario

Protecting our sources of drinking water is the purpose behind the Clean Water Act, 2006 (CWA) and the first component of Ontario's multi-faceted approach to providing safe, clean drinking water.

The source protection process in Ontario is helping municipalities and others identify potential threats to sources of drinking water so that better decisions can be made about managing such threats and plans can be developed to protect these vulnerable sources into the long-term future.

Source protection activities may have an impact on a municipality's land use planning rules. For example, source protection plans developed under the CWA may require new land use planning policies to be included in the municipality's Official Plan, as well as by-laws to prevent future significant threats to drinking water sources.

To learn more about source protection planning for municipalities, please visit www.ontario.ca/cleanwater.

(Source: Ontario Ministry of the Environment, 2006, The Clean Water Act: Promoting Municipal Awareness and Understanding)

Getting Groundwater to the Surface

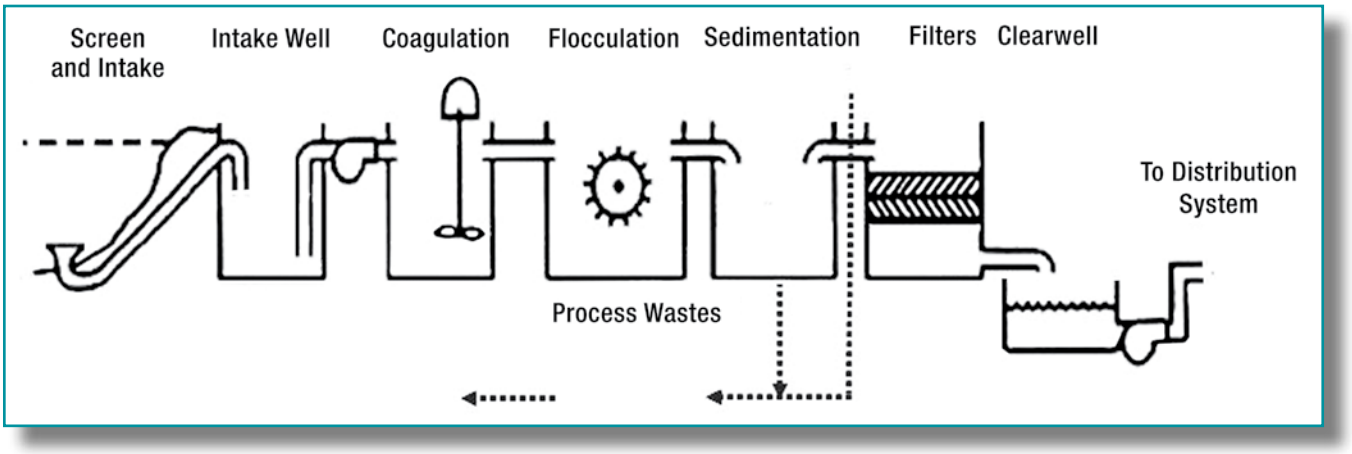
Groundwater is sourced through traditional (gravity) wells and artesian wells.

A traditional well is created by sinking a hole or a shaft into the ground to reach the water in an aquifer. This water is not under pressure and must be pumped to the surface for use.

An artesian well taps an aquifer where the water is under pressure and rising from being confined between two containing layers.

A spring forms when groundwater flows naturally from rock or soil onto the land surface.

Drinking Water Treatment Processes



(Source: Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials)

Treatment processes reduce or eliminate the potential for the presence of pathogens (organisms that can cause illness) in drinking water and are used to ensure your drinking water meets provincial standards. Different water sources necessitate different levels and methods of treatment to ensure safe, clean water is provided to consumers.

In Ontario, all drinking water systems must have a disinfection process in place and all water must be disinfected before it is supplied to the public. The most widely used disinfectant is chlorine, which is a low-cost powerful disinfectant which continues disinfecting as water passes through the distribution system.

Drinking water systems using surface water or groundwater that is under direct influence of surface water must also provide a filtration process ahead of the disinfection.

Some municipalities also use certain treatment processes to address aesthetic problems with drinking water, such as taste and odour issues, that do not pose a risk to public health but which consumers find objectionable, or to address specific issues that are more local in nature, like zebra mussel control.

Here is a list of the treatment process steps taken in a conventional water treatment plant used to treat surface water:

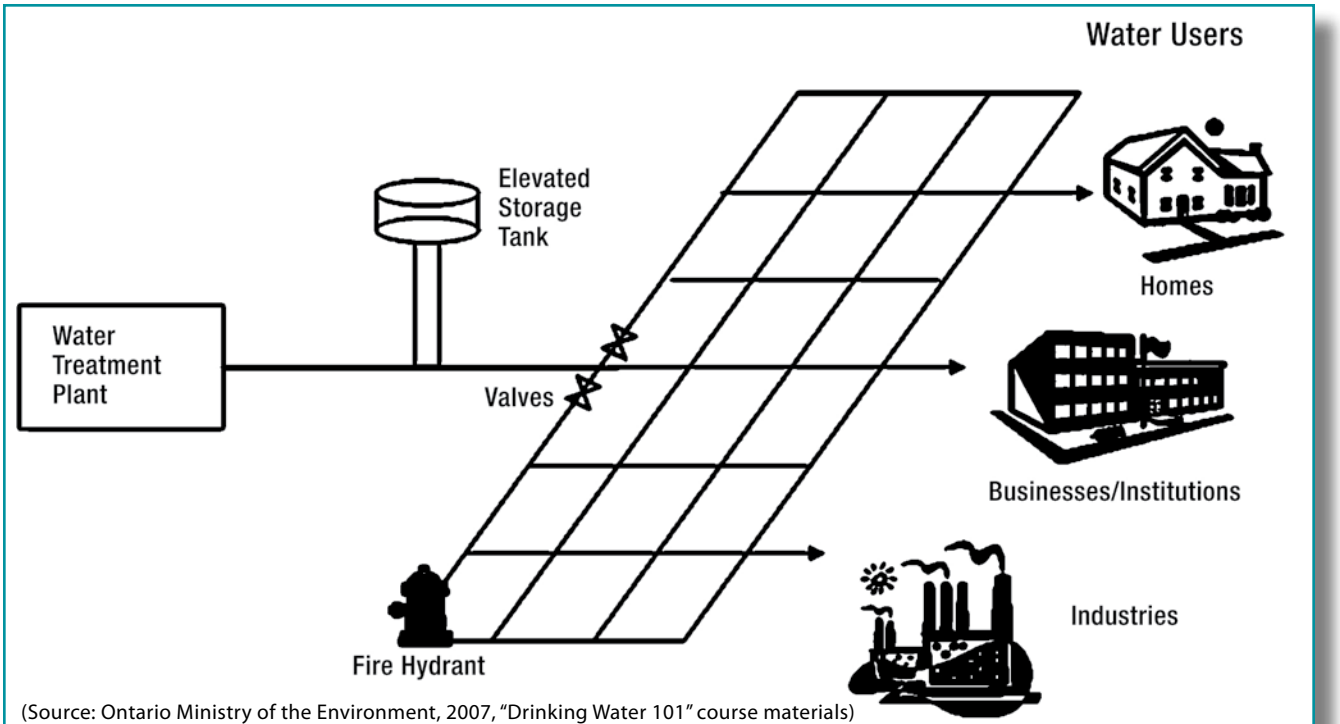
Intake and screen	Intake structures are used to draw water from lakes, reservoirs or rivers. Screens are used to remove large debris from raw water, such as logs or fish, or other unwanted matter (e.g. algae). Screens can also be designed for coarse or fine matter.
Coagulation	Coagulation is a chemical process that causes smaller particles to bind together and form larger particles. The process is used to improve the removal of particles through sedimentation and filtration in the drinking-water treatment process.
Flocculation	Flocculation is the gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles that can then be removed by sedimentation and filtration.
Clarification	The purpose of clarification is to remove suspended solids prior to filtration. In Ontario, the most common method of clarification used is sedimentation or allowing suspended material to settle using gravity.
Filtration	The purpose of filtration is to remove particles from the water not removed during clarification by passing the water through a granular or membrane filter that retains all or most of the solids on or within itself.
Disinfection	Usually the addition of chlorine to raw or filtered water to remove or inactivate human pathogens such as bacteria and protozoa in water and viruses, or for the purpose of maintaining a consistent level of chlorine in a drinking-water distribution system.

Find Out About Your Drinking Water System Treatments Processes

To quickly find out what treatment processes are used by the drinking water system(s) in your municipality, visit Drinking Water Ontario (**www.ontario.ca/drinkingwater**) and look for your municipality on the drinking water quality map.

Water Distribution

The Water Distribution System is the collection of pipes, valves, fire hydrants, storage tanks, reservoirs and pumping stations that carry water to customers.



(Source: Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials)

Water Mains/Piping

Water mains are normally buried in the public street right-of-way. A trunk main is a larger size main used to move large quantities of water. The smaller diameter pipe which connects a water main to an individual building is called a water service. These smaller pipes contain a buried valve to allow service shut-off. Water service piping inside the property line is considered plumbing and is outside municipal jurisdiction.

The pipes of the distribution system must be large enough to meet domestic and industrial needs and provide adequate and ample flow for fire protection.

Types of Pipes

The most common types of material used for pipes include:

- Cast-iron - long-used; sturdy but capable of corroding in some cases
- Ductile-iron - widely used newer version of cast-iron; more flexible and less likely to corrode
- Asbestos-cement - not often used; lightweight, low cost
- Plastic - polyvinyl chloride (PVC) or polyethylene pipes are widely used today.

Valves

Valves are installed at intervals in the piping system so that segments of the system can be shut off for maintenance or repair.

Hydrants

Hydrants are distributed in residential, commercial and industrial areas, and are primarily used by fire departments in fighting fires. Fire hydrants and system valves should be operated and tested at regular intervals.

Water Storage Facilities

Water storage facilities exist in most municipalities to provide a reserve supply for times of emergency or heavy use (e.g. firefighting) and can include:

- elevated tanks (providing water pressure to a system)
- standpipes (also supply pressure from a high point of land)
- hydro-pneumatic systems (use air pressure to create water pressure in small systems)
- surface or in-ground reservoirs (where water can be stored and pumped out for use).

Pumping Stations

Pumping stations are facilities including pumps and equipment for pumping fluids from one place to another. Pumping facilities are required whenever gravity cannot be used to supply water to the distribution system under sufficient pressure to meet all service demands.

Water Meters

Water meters record the amount of water treated and delivered to the water system and measure the amount of water used by customers.

Water Distribution Atlas

Your municipality may maintain a water distribution system atlas which provides detailed mapping of the distribution system and information on infrastructure and maintenance records. Detailed mapping helps your municipality plan for future repairs and is essential for quick response to problems such as water main breaks.

For Further Information

To learn more about drinking water, visit these websites:

www.ontario.ca/drinkingwater – Ontario Ministry of the Environment's Drinking Water Ontario website offering a single point of access to a wealth of information on drinking water and drinking water services in Ontario.

www.ene.gov.on.ca – The website of the Ontario Ministry of the Environment.

www.wcwc.ca – The website of the Walkerton Clean Water Centre, an agency of the Ontario Government, which provides information on available training and education offered by the Centre, especially to those serving small and remote communities.

www.ocwa.ca – The website of the Ontario Clean Water Agency, an agency of the Ontario Government, which includes information on water and sewage works and related services provided by the Agency.

www.e-laws.gov.on.ca – The Ontario Government website providing access to provincial laws and regulations.

www.omwa.org – The website of the Ontario Municipal Water Association.

www.owwa.com – The website of the Ontario Water Works Association, a section of the American Water Works Association (www.awwa.org).

☑SUMMARY OF ACTIONS YOU CAN TAKE

- ☐ Review the reports of the Walkerton Inquiry, specifically sections related to municipal government (Chapter 7 in Report I, Chapters 10 and 11 in Report II). The reports are available online at **www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton**.
- ☐ Become further acquainted with drinking water legislation and regulations, available on the Ontario Government e-Laws website at **www.e-laws.gov.on.ca**.
- ☐ Learn about drinking water safety and its link to public health. Speak to water system and public health staff to learn more.
- ☐ Become familiar with your municipal drinking water system. Ask your water manager to give a presentation to council and/or arrange a tour of your drinking water facilities.
- ☐ Ask your operating authority to speak to your municipal council about your operational plan.
- ☐ Consider and act on any advice (including identified deficiencies and action items) identified during the annual management review process.
- ☐ Review the QMS policy in your operational plan and its commitments.
- ☐ Ask your operating authority to show how it is meeting these commitments.
- ☐ Find out what maintenance, rehabilitation and renewal plans are in place for your drinking water system.
- ☐ Ask your operating authority to present the findings of its annual infrastructure review.
- ☐ Determine when and how your operating authority will communicate to you as an owner.
- ☐ Find out what information is made available to the public and how.
- ☐ Ask your operating authority to review the drinking water emergency plan with council and to explain what responsibilities have been assigned to the owner.
- ☐ Know who will be the spokesperson during a drinking water emergency.
- ☐ Ensure critical staff have taken necessary training on emergency procedures and have participated in testing.
- ☐ Obtain and thoroughly review copies of the most recent annual and summary reports.
- ☐ Ask for explanations of any information you don't understand.
- ☐ Consider, act on and correct any deficiencies noted in the reports.
- ☐ Review your annual inspection results and ask questions if there is any indication of declining quality.
- ☐ Clarify any technical terms.
- ☐ Ask how deficiencies are being addressed.
- ☐ Review your system's standing in the ratings reported in the Chief Drinking Water Inspector's Annual Report. If your rating is less than 100 per cent, ask why.
- ☐ Consider, act on and correct any deficiencies highlighted in the inspection.
- ☐ Ensure there are sufficient resources for appropriate levels of training for municipal staff involved in operating a drinking water system.
- ☐ Confirm that an overall responsible operator (ORO) has been designated and that procedures are in place to ensure all required staff and contractors are certified.
- ☐ Check to see if drinking water operator succession planning is being done.

Be informed. Ask questions. Get answers.
It's your duty.

Glossary

The following is a list of drinking water related terms and phrases you may come across when carrying out your oversight responsibilities.

A

Accreditation Body: a person designated or established as an accreditation body under Part IV of the Safe Drinking Water Act, 2002.

Accredited Operating Authority: an operating authority accredited under Part IV of the Safe Drinking Water Act, 2002.

Adverse Water Quality Incident (AWQI): an event in which an adverse test result triggers a process of notification and protective measures.

Aquifer: a layer of soil, sand, gravel or rock that contains groundwater.

Audit: a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a quality management system conforms to the requirements of the Drinking Water Quality Management Standard (DWQMS).

B

Backflow Preventer: a mechanical device for a water supply pipe to prevent the backflow of water into the water supply system from the service connections.

Boil Water Advisory: a notice issued by a local medical officer of health indicating water should be boiled before human consumption.

C

Certificate of Approval (C of A): a legal instrument which permits the construction or alteration of a drinking water system, or parts thereof. The Ontario Ministry of the Environment issues this document after an engineering review of the proposed facilities and when it is satisfied that the facilities will work as intended and will be able at all times to supply drinking water meeting Ontario Drinking Water Standards and requirements of O.Reg.170/03. For municipal drinking water systems that provide water to residences, the C of A program is being phased out and replaced with the Municipal Drinking Water Licensing Program.

Chemically Assisted Filtration: a water treatment process that uses chemicals, such as alum, as a coagulant to bind small particles together into larger particles that are then easily filtered out when the water passes through sand beds or other filters.

Chlorine Residual: the concentration of chlorine remaining in the chlorinated water at the end of a given contact time that is available to continue to disinfect. Measured as Free Chlorine, Combined Chlorine and Total Chlorine.

Coagulation: the addition of coagulant chemicals to water to allow for the agglomeration of the small suspended particles into larger particles that can be removed by sedimentation and filtration in the drinking water process.

Colony Counts: a scientific measure that identifies the number of bacteria, yeast or moulds that are capable of forming colonies.

Conservation Authority: local watershed management agencies that deliver services and programs that protect and manage water and other natural resources in partnership with government, landowners and other organizations. (http://conservation-ontario.on.ca/).

Contaminant: any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse event.

Cross Connection: the physical connection of a safe or potable water supply with another water supply of unknown or contaminated quality such that the potable water could be contaminated or polluted.

Cryptosporidium: a single-celled protozoan parasite found in the intestinal tract of many animals. If the animal waste containing Cryptosporidium contaminates drinking water, it may cause gastrointestinal disease in humans.

D

Designated Facility: under the Safe Drinking Water Act, 2002, designated facilities are defined as facilities that serve people who are potentially more susceptible to illness if they drink water that is of poor quality. These facilities include schools, universities and colleges, children and youth care facilities.

Disinfection: destruction or inactivation of pathogenic and other kinds of micro-organisms by physical or chemical means.

Drinking Water: (a) water intended for human consumption, or (b) water that is required by Act, regulation, order, municipal by-law or other document issued under the authority of an Act to be "potable" or to "meet or exceed the requirements of the prescribed drinking water quality standards."

Drinking Water System: a system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water and that includes:

(a) anything used for the collection, production, treatment, storage, supply or distribution of water

(b) anything related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the treatment system, and

(c) a well or intake that serves as the source or entry point of raw water supply for the system.

Drinking Water Quality Standards: standards prescribed by Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards) for microbiological, chemical and radiological parameters which when above certain concentrations have known or suspected adverse health effects.

E

***E. coli* (*Escherichia coli*):** a species of bacteria naturally present in the intestines of humans and animals. If animal or human waste containing E. coli contaminates drinking water, it may cause gastrointestinal disease in humans. Most types of E. coli are harmless, but some active strains, especially O157:H7, produce harmful toxins and can cause severe illness.

Exceedance: violation of a limit for a contaminant as prescribed in the Ontario Drinking Water Standards Regulation (O. Reg. 169/03).

F

Filtration: the separation of suspended solid particles from a fluid stream by passing the fluid through a granular or membrane filter medium that retains most of the solids on or within itself.

Flocculation: the gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles that can then be removed by sedimentation and filtration.

G

***Giardia*:** protozoa, usually non-pathogenic, that may be parasitic in the intestines of vertebrates including humans and most domestic animals. If animal waste containing Giardia contaminates drinking water, it may cause gastrointestinal disease in humans.

H

Heterotrophic Plate Count (HPC): HPC is a microbiological test that gives an indication of general bacterial population. HPC results are not an indicator of water safety and should not be used as an indicator of potential adverse human health effects. This is a routine test to monitor water plant operations and assure treatment is working properly.

L

Laboratory: a place where drinking water tests are or will be conducted. In Ontario, laboratories must be accredited and licensed for each type of drinking water test they perform. Laboratories may conduct other types of tests as well.

M

Medical Officer of Health: with reference to a drinking water system, the medical officer of health for the health unit in which the system is located; if none exists, that authority resides with the Chief Medical Officer of Health.

Microbiological organism: an organism so small that it cannot be seen without a microscope, including bacteria, protozoa, fungi, viruses and algae.

Municipal Drinking Water System: a drinking water system (or part of a drinking water system):

- that is owned by a municipality or by a municipal service board established under s. 195 of the Municipal Act, 2001
- that is owned by a corporation established under s. 203 of the Municipal Act, 2001
- from which a municipality obtains or will obtain water under the terms of a contract between the municipality and the owner of the system, or
- that is in a prescribed class.

O

Operating Authority: with reference to a drinking water system, the person or entity that is given responsibility by the owner for the operation, management, maintenance or alteration of the system.

O (con't)

Operational Plan: documents the Quality Management System (QMS) for a subject drinking water system.

Owner: with reference to a drinking water system, every person who is a legal or beneficial owner of all or part of the system (but does not include the Ontario Clean Water Agency [OCWA] or any of its predecessors where OCWA is registered on title as the owner of the system).

P

Pathogen: an organism that causes disease in another organism.

Permit to Take Water: permit from the Ministry of the Environment under the Ontario Water Resources Act, 1990, required of any person who takes over 50,000 litres of water per day from any source.

Potable Water: water that, at a minimum, meets the requirements prescribed by O. Reg. 169/03 (Drinking Water Quality Standards). Other definitions include: water of sufficiently high quality that it can be consumed or used without risk of immediate or long- term harm; water that satisfies the standards of the responsible health authorities as drinking water; water that is 'fit to drink'.

Protozoa: a very diverse group comprising some 50,000 organisms that consist of one cell. Most are able to move on their own. Some are a health concern in drinking water. (See Giardia and Cryptosporidium)

Provincial Officer Order: an order issued by a Ministry of the Environment Provincial Officer to any person who contravenes any act governed by the Ministry of the Environment.

R

Raw Water: surface or groundwater that is available as a source of drinking water but has not received any treatment.

S

Source Water: untreated water in streams, rivers, lakes or underground aquifers which is used for the supply of raw water for drinking water systems.

Source Water Protection: process which includes identifying potential risks to drinking water, assessing and addressing these risks, preventing new ones, and monitoring success.

T

Total Coliform Bacteria: a group of waterborne bacteria consisting of three main sub-groups with common characteristics that is used as an indicator of water quality. The presence of total coliform bacteria in water leaving a treatment plant, or in any treated water immediately after treatment, could indicate inadequate treatment and possible water contamination.

Treatment System: any part of a drinking water system that is used in the treatment of water, including:

- anything that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing
- anything related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system
- a well or intake that serves as the source or entry point of raw water supply for the system.

Turbidity: a visible haze or cloudiness in water caused by the presence of suspended matter, resulting in the scattering or absorption of light. The cloudier the water, the greater the turbidity.

W

Walkerton Inquiry: the public commission of inquiry led by Justice Dennis O'Connor into the events that occurred in May 2000 when the water supply in the Ontario town of Walkerton became contaminated with a strain of E.coli bacteria.

Waterborne Illness: a disease transmitted through the ingestion of contaminated water. Water acts as a passive carrier of the infectious agent, chemical or waterborne pathogen.

Watershed: a region or area bounded peripherally by a divide and draining into a particular watercourse or body of water.

Be informed.
Ask questions.
Get answers.

It's your duty.

www.ontario.ca/drinkingwater

For more information, call
the Ministry of the Environment
at **1-800-565-4923**

Email: ***drinking.water@ontario.ca***

PIBS# 7889e

Ontario

Wednesday, February 29, 2012

Information submission by: Sheldon Thomas
Principal
Clear Water Legacy
www.clearwaterlegacy.com
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(905) 333-9203

Good day, Mr. Mayor and Orillia Councillors.

My name is Sheldon Thomas.

I am a retired Manager of Water Distribution for the City of Hamilton.
I am also the principal of 'Clear Water Legacy', a company that trains water system operators across the province.

I am writing to strongly advise you against implementing the practice of artificial water fluoridation.
In fact, the word 'artificial' should be your first red flag.

Prove it!

A number of red flags were raised last January in the Region of Peel. Faced with the Medical Officer of Health's recommendation to continue the practice of water fluoridation, the mayors and councillors of Peel Region, led by highly-respected Mississauga Mayor Hazel McCallion, voted to go a different direction.

Peel's response to the MOH and to Health Canada's Chief Dental Officer was along the lines of, 'We've have heard the claims, now provide the *proof*'.

The mayors and councilors drafted a resolution requiring:

- That Health Canada provide absolute proof that HFSA (fluorosilicic acid) is safe for use in drinking water
- That randomized, double-blind toxicological tests be conducted on HFSA as a single chemical
- That Health Canada designate HFSA a drug (it is used for the single purpose of reducing dental caries, a disease by definition), and regulate it as such.
- That at least one properly conducted, double blinded, randomized, placebo-controlled clinical trial be conducted to prove that water fluoridation works to reduce cavities, as claimed. **See appendix A**

The Region of Peel will certainly share the results of that resolution with all communities, if, and when, answers emerge.

Promoting fluoridation

Fluoridation will be promoted in Orillia as something that your community *needs* to reduce caries (cavities).

You will hear about the 90 national and international organizations that endorse artificial water fluoridation. But you will *not* be told that 46 of the 90, half of that group, are *dental* organizations.

Those 46 dental organizations will invite Orillia residents to swallow a small concentration of fluoride (a known protoplasmic poison [1]) *for a lifetime*, with absolutely no regard for what the fluoride ion can do after it enters the bloodstream and is shared throughout the entire body.

The Chief Dental Officer for Health Canada can be expected to attend in Orillia. He will likely be accompanied by a strong contingent of dentists and dental hygienists who will help him deliver the Health Canada fluoridation message.

Please do not lose sight of this one fact … dentists are experts in conditions that exist among the bones, teeth and soft tissue *within the oral cavity*. We need them to be as good as they are .. *in <u>that</u> area*.

But there is no dental school on this continent that teaches dentists the biological effects of turning the fluoride ion loose against the bones, soft tissue, organs and cells throughout the rest of the body.

Dentists do not have the specific training or knowledge base to assure you that ingested fluoride is either *safe* or *effective*.

Toxicologists, biochemists, teratologists and pharmacologists are counted among those researchers who *do know* the fluoride ion. They can present to you a library of animal and clinical studies that link fluoride to a long list of diseases and debilitating conditions. [2]

It is just inconceivable to expect the fluoride ion, the most aggressive electro-negative element on earth, to find its way from the stomach directly to the teeth without seeking targets to bond with along the way.
With every bonding, fluoride alters or corrupts a bodily mechanism, creating substantial biological change.

Fluoride bonds strongly with every chemical, metal and mineral in its path. The only thing that it does not bond with is itself.
There is no reason to believe that the fluoride ion will spare the human body.

It's also inconceivable that Health Canada can claim, in the face of all of the emerging studies that point to fluoride harm, that there is "no credible evidence" that fluoride causes anything worse than mild dental fluorosis. [3]

The claimed benefits

If there are any benefits to the use of fluoride to reduce cavities, the Centers for Disease Control (CDC) and the American Dental Association (ADA) state that fluoride's benefit is primarily *topical* .. *applied* to the surface of the tooth, and not systemic (swallowed in drinking water).

The CDC has held that position for better than 13 years. The CDC has also issued findings that state that it is <u>not</u> established that higher fluoride content in tooth enamel will prevent cavities. [4]

Yet the CDC remains the most cited pro-fluoridation agency on the 'List of 90'.

Perhaps you were not to know that all pro-fluoridation statements credited to the CDC are, in fact, the opinion of the Oral Health (Dental) Division of the CDC. No other scientific or medical arm of the CDC is invited to study, or to comment on, the health effects of artificial water fluoridation.

A Statistics Canada Report, compiled between 2007 and 2009, studied dental caries rates between the virtually non-fluoridated province of Quebec and heavily-fluoridated Ontario.

If fluoridation works as promoted, readers of that report would have expected to see the caries reduction among fluoridated Ontario youth in the oft-quoted range of 25% to 40%, compared to those studied in Quebec.

Statistics Canada, instead, reported that fluoridated Ontario children had virtually the same cavity rates as those in non-fluoridated Quebec.

The difference in cavity rates between the two provinces amounted to less than ½ a cavity per child .. almost statistically insignificant. **5**

There are serious risks associated with artificial water fluoridation, particularly from the chemical that you'll be required to place in Orillia's water.
To even *consider* living with those risks, one has to be convinced that there is *great* benefit.

A possible savings of less than a half a cavity per child is not a strong enough benefit to warrant exposing your residents to the injury that fluoride can cause.

There are dozens of studies, assembled from all over the world, that show there to be no correlation between artificial water fluoridation and caries reduction. **6**

Even Health Canada's own 2008 review of fluoridated water failed to identify even one double-blinded, randomized clinical trial to prove that fluoridation works, after correcting for diet and delay in tooth eruption. **7**

You drink natural fluoride anyway ..

It will be suggested to you that water fluoridation is just a means of 'topping up' the already present levels of natural fluoride that exists in Orillia's source water. The *natural* mineral in surface and ground water is calcium fluoride.
If you decide to implement artificial water fluoridation, you will <u>not</u> be topping up calcium fluoride with *more* calcium fluoride.

The fluoridating chemicals being used across Ontario are primarily synthetic silicofluorides, such as sodium fluoride (used in smaller systems mainly, but expensive), hydrofluorosilicic acid and hexafluorosilicic acid (shortened, HFSA or fluorosilicic acid).

Orillia, given its size and resources, will likely have a choice of the latter two chemicals.

These chemicals are category 1 toxins, and extremely dangerous to handle.
They are primarily the waste byproducts of the phosphate fertilizer industry in the southern states.
Arriving by specially modified tanker trucks, these chemicals can be polluted by any of a dozen contaminants, including lead, arsenic, and mercury. **8**

The USEPA classifies lead as a 'probable human carcinogen', <u>likely</u> to cause cancer. **9**
It classifies arsenic as an <u>outright</u> 'human carcinogen'. **10**

Lead and arsenic are nearly always on the chemical 'certificates of analysis' for HFSA shipments sent to water plants. **Appendix B**
They are there in *very* small concentrations (parts per *billion)*, and will later be highly diluted in drinking water, but dilution will not make them disappear.

Arsenic and lead, as well as fluoride itself, are persistent bio-accumulative toxins which build up in the human body over time.

Artificial water fluoridation would require Orillia residents to absorb those 'insignificant' carcinogens *for a lifetime*, in the fluoridated water that they drink, from the foods that are prepared in fluoridated water, and through the pores of their skin at every fluoridated shower and bath.

Those who drink and absorb more water than most (children, athletes, diabetics, labourers) will have an understandably greater exposure to these 'insignificant' contaminants.

There are no studies to predict how many *additional* cancers are going to be created in a community that allows its residents to drink and cook with fluoridated water that is further corrupted by these trace contaminants.
There are also no studies to suggest that the number of *additional* cancers will be zero.

Unfortunately, no one *makes*, and no one *sells*, pure fluorosilicic acid.

According to the AWWA B703 Fluorosilicic Acid Standard, Orillia *could* ask the chemical plants in the states to remove all of the dozen or so trace contaminants in its chemical shipments. [11]
But Orillia, the purchaser, would have to advise the plants as to *how* removal is to be carried out, and that would certainly sky-rocket the costs of the 'purified' product.

Orillia would have to be especially careful that all radioactive contaminants (radionuclides) are removed from the chemical 'batch' that supplies their shipment. Uranium is often present in the phosphate rock that is ground up, processed and cooked in sulfuric acid to make super phosphate fertilizer. Uranium is commonly released in the process.

The city will be told that radioactive readings at the plants are below detection. [12] At some point, the City of Orillia may learn that the chemical plants that make fluorosilicic acid are inspected, and the batch contaminants measured, only once a year. [13]

Any comfort there?

Orillia is not *compelled* to fluoridate

There is no wording in the Fluoridation Act that compels any municipality to artificially fluoridate its drinking water. The Act simply states that it is legal to do so, should it be done. It remains a voluntary decision of the municipality.

Orillia may elect to fluoridate, but it will soon learn that it will stand alone to face the consequences of that decision, and the consequences of voluntarily electing to administer into the drinking water of its residents a chemical that has not been proven safe for such a use.

Going into this decision, Orillia should understand that no government or health agency in Canada regulates, takes ownership of, or is accountable for the use of any fluoridation chemicals in common use today.

Fluorosilicates are being fed to millions of Canadians, even though there has never been a single toxicological study or clinical trial performed on these chemicals to prove that they are safe for short or long-term ingestion.

Health Canada has been brought to admit that it does ***no*** research on HFSA. [14]
It relies primarily on its own internal reviews of research done elsewhere.

Unfortunately for Health Canada, there has been very little research into the health effects of HFSA to support its position that the chemical is safe for use in drinking water.

In 2001, the US EPA admitted, under oath before the US Congress, that it had **"no information on the effects of silicofluorides on health and behavior."** [15]

The entire Scientific and Technology Arm of the USEPA could not come up with *anything*, even though proponents had claimed for 60 years that hundreds, maybe thousands, of studies existed, all proving that artificial water fluoridation was safe.

Despite a subsequent 2002 EPA Request For Assistance (RFA) for further research into the safety of HFSA and other silicofluorides, no useful information has surfaced to date.

If the fluoridation chemicals cannot be proven safe, then the practice of water fluoridation cannot be proven safe.

Legal actions ahead

Orillia should be forewarned that legal actions have commenced in the United States against municipalities and water authorities that have chosen to impose artificial water fluoridation upon their residents. [16]

Lawyers are charging water authorities, *and others*, with :

- non-disclosure of the injurious side-effects of fluoride
- illegal use of an untested chemical in drinking water
- mis-representation of the benefits of fluoridation
- suppression of data that would have proven fluoridation hazardous

As these lawsuits gain traction south of the border, similar charges may be filed in Canadian jurisdictions. The City of Orillia may be wading into the fluoridation waters just as those waters are beginning to heat up.

Separate fact from promotion

Mr. Mayor and councillors, I ask you to put on a doubter's face throughout these entire proceedings. Demand proof of everything spoken, and written.

If water fluoridation is as safe and effective as Health Canada states, then demand proof of both. If proof exists, then you shouldn't have to wait too long. But examine carefully what is presented as 'proof'.

On the issue of artificial water fluoridation, you would be well-advised to follow Mayor McCallion's lead.

With respect,

Sheldon Thomas
Principal,
Clear Water Legacy
www.clearwaterlegacy.com
shelthomas@cogeco.ca

References

1. *Journal of the American Medical Association*, Sept 18, 1943, Editorial.
"Fluorides are general protoplasmic poisons, probably because of their capacity to modify the metabolism of cells by changing the permeability of the cell membrane and by inhibiting certain enzyme systems. The exact mechanism of such actions is obscure."

2. **Cancers** Taylor A, Taylor NC. (1965). 'Effect of sodium fluoride on tumor growth'. Society for Experimental Biology and Medicine 119:252-255.

Coronary artery disease 'Association of vascular fluoride uptake with vascular calcification and coronary artery disease' Yuxin Li, Gholam R Berenji et al., Nucl Med Commun. 2012 Jan ;33(1):14-20. PMID: "There was significant correlation between history of cardiovascular events and presence of fluoride uptake in coronary arteries."

Increased bone fracture in both the young and the elderly Riggs BL, et al. (1990). Effect of Fluoride treatment on the Fracture Rates in Postmenopausal Women with Osteoporosis. New England Journal of Medicine 322:802-809.

Calcification (stiffening) of tendons and joints, arthritic symptoms Bang S, et al. (1985). Distribution of fluoride in calcified cartilage of a fluoride-treated osteoporotic patient. Bone 6: 207-210.

Brain injury producing Alzheimer's-like symptoms 'Chronic administration of aluminum–fluoride or sodium–fluoride to rats in drinking water: alterations in neuronal and cerebrovascular integrity', Julie A. Varner et al., *Psychology Department, Binghamton University, Binghamton, NY, USA* 1997

Reduced IQ Li Y, et al. (2003). The effects of endemic fluoride poisoning on the intellectual development of children in Baotou. Chinese Journal of Public Health Management 19(4):337-338.

Attention deficit disorders Dr. Phyllis J. Mullenix, Toxicology Department Forsyth Research Institute, Boston, MA., 'Neurotoxicity of Sodium Fluoride in Rats', 1995

Enzyme poisoning "There is plenty of evidence to indicate that fluorine in the amount of 1 ppm or slightly more interferes with enzyme systems and these enzyme systems are involved in the growth of bones, in the functioning of nerve tissue and so forth. It is clear that fluoridation is a calculated risk." Dr. Robert S. Harris, Ph.D, Director of Nutritional Biochemistry Laboratories, Massachusetts Institute of Technology.

Hypothyroidism "In humans, effects on thyroid function were associated with fluoride exposures of 0.05-0.13 mg/kg/day when iodine intake was adequate and 0.01-0.03 mg/kg/day when iodine intake was inadequate." National Research Council (2006) Fluoride in Drinking Water: A Scientific Review of EPA's Standards, p 218.

Elevated lead uptake into the bloodstream 'Fluoride increases lead concentrations in whole blood and in calcified tissues from lead exposed rats', Sawan RM et al., 2010, Journal Toxicology, pg 21-26

Depleted immune systems Gibson, 1992, Effects of Fluoride on Immune System Function, Complementary Medical Research, Issue 6, pg 11-113; Sutton P, 1991, 'Is the Ingestion of Fluoride an Immunosuppressive Practice?', Medical Hypotheses 35, 1-3,

Alarming prevalence of dental fluorosis (mottled, discoloured and porous tooth enamel) "An increase in fluoride content and decrease in calcium content in fluorosed human teeth were observed when compared to the control." Susheela AK, Bhatnagar M. 1999. Structural aberrations in fluorosed human teeth: Biochemical and scanning electron microscopic studies. *Current Science* 77: 1677-1680.

"Fluorosed enamel has a reduced amount of mineral when compared with control enamel." Denbesten PK, et al. 1985. Changes in the fluoride-induced modulation of maturation stage ameloblasts of rats. *Journal of Dental Research* 64: 1365-70.

3. Health Canada Statement on Fluoride in Drinking Water June 23, 2011 "Currently available peer-reviewed scientific studies continue to indicate that there are no adverse health effects from exposure to fluoride in drinking water at or below the maximum acceptable concentration."

4. "The prevalence of dental caries in a population is not inversely related to the concentration of fluoride in enamel, and a higher concentration of enamel fluoride is not necessarily more efficacious in preventing dental caries."
Centers for Disease Control and Prevention (2001) 'Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States' *Morbidity and Mortality Weekly Report* 50(RR14): 1-42.

5. Globe and Mail, Martin Mittelstaedt, Thursday, Apr. 15, 2010, "After a request from The Globe and Mail for a breakdown of the cavity rates by province, Statistics Canada tabulated the figures for Ontario and Quebec. Results showed that if fluoridation is the only major difference between the two provinces, the chemical is preventing fewer than half a cavity per child in Ontario. Health Canada down played the significance of the findings."

6. Foulkes RG, Review of Report: Investigation of Inorganic Fluoride and its Effect on the Occurrence of Dental Caries and Dental Fluorosis in Canada -- Final Report

Centers for Disease Control and Prevention (2001) Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. *Morbidity and Mortality Weekly Report* 50(RR14): 1-42.

The largest study of tooth decay in America, by the U.S. National Institute of Dental Research in 1986-1987, showed that there was no significant difference in the decay rates of 39,207 fluoridated, partially fluoridated, and non-fluoridated children, ages 5 to 17, surveyed in the 84-city study. (*"New Studies cast doubt on fluoridation benefits," by Bette Hileman, Chemical & Engineering News. Vol 67, No. 19, May 8,1989).*

The observed world-wide decline in tooth decay over the past four decades has occurred at the same rate in areas that are not fluoridated as in areas that are. *("The Mystery of Declining Tooth Decay", Mark Diesendorf. Nature, July 10, 1986, pp. 125-129).*

"Agreement is universal that excessive fluoride intake leads to loss of calcium from the tooth matrix, aggravating cavity formation throughout life rather than remedying it, and so causing dental fluorosis."
UNICEF's Position on Water Fluoridation; Water, Environment & Sanitation.
(www.unicef.org/programme/wes/info/fluor.htm)

Dr. Richard Foulkes, special consultant to the B.C. Minister of Health, wrote in 1992: "There is evidence that fluoridation does not prevent tooth decay and may cause serious illness, birth defects and premature death."

Dr. John Colquhoun, former Principal Dental Officer, Auckland, New Zealand : "I looked at the new dental statistics that had been collected while I was away for my own Health District, Auckland. These were for all children attending school dental clinics — virtually the entire child population of Auckland. **To my surprise, they showed that fewer fillings had been required in the non-fluoridated part of my district than in the fluoridated part.** When I obtained the same statistics from the districts to the north and south of mine

— that is, from "Greater Auckland," which contains a quarter of New Zealand's population — the picture was the same: tooth decay had declined, but **there was virtually no difference in tooth decay rates between the fluoridated and non-fluoridated places. In fact, teeth were slightly better in the non-fluoridated areas**. I wondered why I had not been sent the statistics for the rest of New Zealand. When I requested them, they were sent to me with a warning that they were not to be made public. Those for 1981 showed that in most Health Districts the percentage of 12- and 13-year-old children who were free of tooth decay - that is, had perfect teeth - was greater in the non-fluoridated part of the district."

BENEFITS AND RISKS OF WATER FLUORIDATION.. An update of the 1996 Federal-Provincial Sub-committee Report Prepared under contract for:
Public Health Branch, Ontario Ministry of Health, Dr David Locker, Community Dental Health Services Research Unit, Faculty of Dentistry, University of Toronto, November 15, 1999 ..
" Although current studies of the effectiveness of water fluoridation have design weaknesses and methodological flaws, the balance of evidence suggests that rates of dental decay are lower in fluoridated than non-fluoridated communities. **The magnitude of the effect is not large in absolute terms, is often not statistically significant and may not be of clinical significance**."

7. Statement of Dr. Hardy Limeback BSc, PhD, DDS, Professor and Head, Preventive Dentistry, Faculty of Dentistry University of Toronto, Nov. 15, 2011
   http://www.hc-sc.gc.ca/ewh-semt/pubs/watereau/ 2008-fluoride-fluorure/index-eng.php

8. NSF Fact Sheet on Fluoridating Chemicals, Table 1, pg 7

9. USEPA Integrated Risk Information System (IRIS), Lead and Compounds (inorganic) (CASRN 7439-92-1), 11.A.: Evidence for Human Carcinogenicity .. Classification B: 'probable human carcinogen'

10. USEPA Integrated Risk Information System (IRIS), Arsenic (inorganic)(CASRN 7440-38-2) 11.A.: Evidence of Human Carcinogenicity .. Classification A: human carcinogen

11. AWWA Standard B703 Fluorosilicic Acid, Sec. 4.3 *Impurities,* 4.3.4 Additional Impurity Limits

12. NSF International July 2007 letter by Stan Hazan, General Manager, NSF Drinking Water Additives Certification Program, to Congressman Ken Calvert, Chairman of the Subcommittee on Energy and the Environment Committee on Science, U. S. House of Representatives

13. NSF/ANSI 60-2009 Drinking Water Treatment Chemicals – Health Effects

14. Petition: No. 221B, Office of the Auditor General of Canada, Petitioner: Carole Clinch
    Health Canada response to Q7, Q8, Q9, Q10, Q13, Q19:
    "Health Canada does not conduct research on the chemistry of fluoride species."

15. "Masters and Coplan, besides showing that silicofluorides are probably increasing lead in children, have discovered a 1975 Ph.D. thesis in German showing that silicofluorides are far from completely dissociate in water, and these partially dissociated residues are potent acetyl cholinesterase inhibitors. **As a result of their work, EPA was forced to admit to Congressman Calvert that they have absolutely "no information on the effects of silicofluorides on health and behavior**." \
Further, EPA officials now admit that they are not sure that hydrofluosilicic acid completely dissociates when added to water supplies and are planning on studies to determine what does happen. Silicofluorides have been added to drinking water supplies for 50 years without any idea of the possible consequences."
Robert J. Carton, Ph.D. Chief, Environmental Protection Office of Regulatory Compliance & Quality U.S. Army Medical Research & Material Command

16. SAN DIEGO, Aug. 10, 2011 /PRNewswire/ -- Alleging willful misrepresentation and deceptive business practices by Metropolitan Water District of Southern California, attorneys for citizen/consumers from San Diego, Los Angeles and Ventura Counties filed a lawsuit in the public interest of millions of consumers in Southern California, citing that MWD of SoCal has made claims of safely and effectively treating and preventing dental disease in recipient consumers, while selecting and delivering a hydrofluosilicic acid drug through their water system that has never been approved for safety and effectiveness, nor in the expected dosages delivered by MWD through retail water districts, either topically, systemically through ingestion, or trans-dermal exposures through baths and showers.

Letters of interest follow

Appendix A

Resolution

Date: January 12, 2012

Moved By: Councillor Mullin
Seconded By: Councillor Sprovieri

That the Region of Peel request that Health Canada regulate the fluorosilicates hexafluorosilicic acid (H_2SiF_6) and sodium silicofluoride (Na_2SiF_6), used as a treatment for dental cavities in drinking water, as drugs under the Food and Drugs Act;

And further, that all chemicals, especially fluorosilicates, added to drinking water for the purpose of treating dental decay undergo new drug applications and be assigned drug numbers by Health Canada;

And further, that classification of fluorosilicates as drugs shall be based on at least one long-term toxicology study to determine health effects in humans;

And further, that at least one properly conducted, double blinded, randomized placebo controlled clinical trial be used to provide effectiveness as the basis for a new drug classification;

And further, that the Region of Peel make the above recommendations to Health Canada to reassure the citizens of Peel that the use of fluorosilicates added to drinking water for the purpose of treating dental decay is safe and what the health effects are;

And further, that a copy of this resolution be sent to the Federal and Provincial Minister of Health, and Peel area MPs and MPPs;

And further, that Peel MPs and MPPs be requested to follow up on this issue with the Ministers of Health and report back to Regional Council with a response.

CARRIED

Appendix B

Mosaic

8813 Highway 41 South - Riverview, Florida 33569
Telephone (813) 677-9111 - Telex 52666
FAX - Accounting (813) 671-6283

CERTIFICATE OF ANALYSIS

FLUOROSILIC ACID

Results of Analysis of a Weighted Average Sample

CAR NO: SHPX204535

Date: August 31, 2006

ANALYSIS	RESULT
NET H_2SiF_6	23.67 %
P_2O_5	0.13 %
FREE ACID*	0.34 %
DENSITY	1.216 g/ml
COLOR (APHA Std Method)	40
LEAD	<1 ppm
ARSENIC	34.75 ppm
CHLORIDE	

WE CERTIFY THAT PRODUCT SHIPPED WITH THIS CERTIFICATE OF ANALYSIS MEETS AWWA STANDARD B703-97 AND ANSI/NSF STANDARD 60 REQUIREMENTS

* AWWA B-703-00

NSF

Certified to ANSI/NSF 60	Max. Use 6 mg/L

Kwas: Sakyi-Arafo / QC lab manager

NOTICE: A PORTION OF THE ABOVE MATERIAL IS RETAINED FOR FORTY-FIVE DAYS.

- All fluoride products used for dental care must now be regulated by Health Canada under the Food and Drugs Act and associated Regulations, except fluorosilicates (hexafluorosilicic acid and sodium silicofluoride) added to drinking water for the sole purpose of treating dental disease;
- The Food and Drugs Act and its associated Regulations are regarded as the single most important element of the federal safety net system, designed to help protect Canadians from unsubstantiated claims of safety and efficacy;
- The only safety assessment of fluorosilicates added to our drinking water is the NSF Standard 60, provided by the private consortium National Sanitation Foundation which certifies these products, based on well-documented irregularities which are not consistent with the requirements of the standard;

I would like to confirm whether or not Health Canada has any regulatory approval mechanism for fluorosilicates used in artificial water fluoridation, either as drugs to treat (dental) disease, as dietary food additives to prevent cavities or as a mineral to prevent or treat cavities.

If not, I would also like to know whether or not Health Canada is considering the regulation of fluoridation products such as hexafluorosilicic acid, which are commonly known to be used as a public health measure to treat or prevent dental disease (cavities) in the same way that all other fluoride products used in the prevention or treatment of dental disease are now regulated under the Natural Health Product Regulations.

Peel Regional Council members will be considering this contentious issue at our next meeting on January 12, 2012. I would greatly appreciate a response to this letter before this date so that I and all member of Regional Council can be fully informed to make an educated decision on this issue as it affects human health and our environment in the Region of Peel.

I thank you in advance and look forward to your reply.

Sincerely,

HAZEL McCALLION, C.M., LL.D.
MAYOR

MISSISSAUGA
Leading today for tomorrow

THE CORPORATION OF THE CITY OF MISSISSAUGA
300 CITY CENTRE DRIVE, MISSISSAUGA, ONTARIO L5B 3C1
TEL: (905) 896-5555 FAX: (905) 896-5879

City of Orillia

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

The City of Orillia is interested in what you have to say about the potential fluoridation of the municipal water supply. Please take a moment to provide your comments and contact information below. Your input is important to us. Thank you for your participation.

PLEASE SUBMIT COMPLETED FORMS TO THE RECEPTION TABLE BEFORE LEAVING TONIGHT, OR BY FRIDAY, MARCH 30TH, 2012 TO:

City of Orillia
Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: JUSTYNA LASOCKA- MILLER

Address: 241 NOTTAWASAGA ST.

Phone: 705 327 3161 Email: justynalasocka17@gmail.com

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

PLEASE DO NOT FLUORIDATE OUR WATER!

(Continue on reverse)

City of Orillia

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Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Sue Mallinson

Address: 8 Watson Crt. Orillia L3V 7S5

Phone: 705 326-9091 Email: sue.mallinson@sympatico.ca

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

All practices need to be re-examined periodically. I used to think that because fluoridation of water has occurred for approx. 60 years that it must be okay. However, I know realize that the issue should be revisited and reassessed. I believe that applying fluoride topically such as in toothpaste or a wash etc at dentist would be a preferred way of providing tooth protection. Blanket distribution to everyone in the water seems haphazard at best. With drugs children, youth and adults required different doses. Why should everyone get the same dose of fluride in a glass of water. Infants would get an exceedingly high dose of fluoride compared to their body weight with fluoridated water.

(Continue on reverse)

I believe that public health services could be improved in the community to provide education, fluoride toothpaste and other means of improving improving the quality of children and adults teeth. This effort could be focused on the most vulnerable segment of society.

Questions:

(P) re Simcoe Muskoka district health unit sheet - Fluoride Facts next. has a survey been done of families in Orillia to see ① how often they visit a dentist (given 6 months?), ② diet, ③ income level?

general: Is dental health taught in elementary schools?

City of Orillia

RECEIVED
FEB 29 2012
PUBLIC WORKS
ENGINEERING

City of Orillia
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Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Debra Curti

Address: 159 Nottawasaga St

Phone: 330-0083 Email:

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

* First of all, I'm totally against putting chemicals into our water - fluoride or any other chemicals - its our Canadian right to clean NOT medicated water
* who decides? who is qualified on our City Counsel (no disrespect)
* The decision has to be made by the people not the counsil !!
* The people all people need to be really informed = Time & $ reliable

(Continue on reverse)

per Jason.

Fluoride needs to be stored in a "Chemical Room" @ water works.

water = ½ of health

City of Orillia

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Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: DAVID MALLINSON

Address: 8 WATSON COURT, ORILLIA L3V 7S5

Phone: 705-326-9091 Email: db.mallinson@gmail.com

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

I am totally against flouridation for the following reasons:

a) No other medication is administered through the water supply

b) Dosage is totally uncontrolled and uneven - babies can receive far more than is safe.

c) The chemical used to flouridate is a toxic sludge by-product of the chemical industry, and is NOT pharmaceutical grade

d) Benefits of flouridation are doubtful – there have been no peer-reviewed studies of its long-term effects.

e) The excess flouride and other toxins not consumed by humans ends up in the environment.

f) There are alternatives to general flouridation of water. There need to be targeted approaches to tackling tooth decay. A shotgun approach is not appropriate.

(Continue on reverse)

Received Feb. 29th, 2012 at Public Forum - KC.

Orillia, Be Aware!

"Fluoride is often found naturally in water. In Orillia's water more fluoride needs to be added to be effective, but only a minuscule amount.."
– **Dr. Charles Gardner, Simcoe Muskoka Medical Officer of Health**

Dr. Charles Gardner is up to it again.. he is rejecting the benefits of the earth's resources by not considering our local water to be effective for us until he has tampered with it. Dr. Charles Gardner is also misleading us all because he is missing vital information in his proposal to fluoridate the water. His statement leads us to believe that Orillia has low levels of fluoride and that the introduction of Artificial Water Fluoridation will raise fluoride levels to where they should be, but that belief would be entirely wrong. The fact is that hundreds of chemicals can be added to municipal water supplies all under the name fluoride. Natural fluoride is Calcium Fluoride(CaF2), but as illogical as it may be, fluoridation programs do not use it.

Dr. Charles Gardner's ~~weapon of choice~~ **fluoridation chemical of choice** will likely be Hydrofluosilicic acid(H2SiF6) the same fluoridation chemical that is being used in other places locally including where I'm from, Huntsville. If you have never heard of Hydrofluosilicic acid then that alone should be proof that Dr. Charles Gardner is excluding crucial details. He is intent on ~~medicating and poisoning~~ **imposing Artificial Water Fluoridation (AFW)** on **everyone** as tooth medication, but omits to mention the ~~poisonous, carcinogenic cocktail~~ **specific fluoridation chemical** that he wants us to do it with.

While an oversight may be forgivable he does this too often, but more importantly the fluoridation chemical he is using is actually illegal for the use he intends it for and he should be impeached for it. Compare natural **Calcium Fluoride(CaF2)** with anthropogenic **Hydrofluosilicic acid (H2SiF6)**. You don't have to be a chemist to understand that they are tremendously different, comparing the two would be like comparing a Cessna aircraft and a military fighter jet. Calcium Fluoride is composed of one calcium atom and two fluorine atoms per molecule while Hydrofluosilicic acid is composed of two hydrogen atoms, one silicon atom and six fluorine atoms! Calcium Fluoride is **moderately toxic** due do the two fluorine atoms even with calcium which reduces the toxicity, but Hydrofluosilicic acid has six fluorine atoms and contains no calcium.

It is important to understand how dangerously reactive Hydrofluosilicic acid is. If you have a hard time understanding this then think about Hydrogen Peroxide(H2O2). All Hydrogen Peroxide consists of is water and oxygen, but even diluted to a three-percent pharmaceutical grade solution it is effective and it reacts because it has two oxygen atoms per molecule. Imagine how reactive Hydrogen Peroxide would be with six oxygen atoms per molecule! Additionally when we use Hydrogen Peroxide for **wounds** it is a pharmaceutical grade product, but the fluoridation chemicals intended for **human consumption** are industrial grade. It is all confusing isn't it?

How can fluoride promoters care about our dental health, but not about our bodies as a whole, our freedom to information and freedom of expression? I cite *"our bodies as a whole"* because there is no such thing as a drug without side effects. Side effects are inadvertent conditions caused to our bodies when administering drugs. Ask yourself what the side effects of Artificial Water Fluoridation are. I also cite *"freedom to information"* because the details that we are given about fluoride are inexcusably brief.

Lastly, I cite *"freedom of expression"* because Dr. Charles Gardner sued a Huntsville doctor for professional misconduct simply for addressing his concerns about the current program of fluoridation and it's hazards publicly. Hydrofluosilicic acid is **extremely toxic**, but even stating this fact does not do justice to explain the danger of Hydrofluosilicic acid or other fluoridation chemicals. I advise everyone to research fluoride and fluoridation on their own: http://www.fluoridealert.org Over 4,000 professionals call for an end to **AFW**.

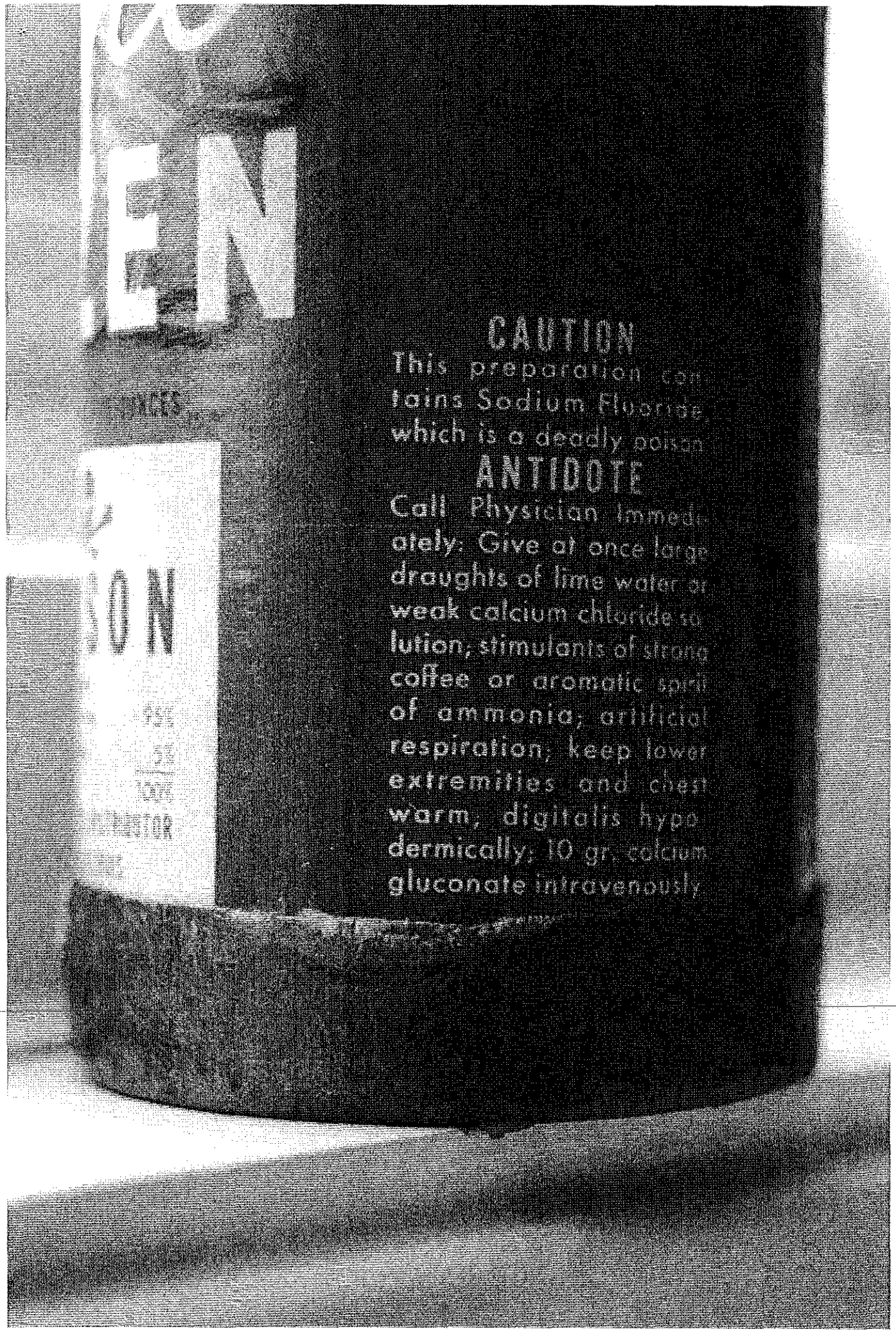
Written by: Kyle O'Connor, Huntsville.
Contact: questionyourreality@hotmail.com

Look What I Purchased on eBay!

I would like to show the entire district of Muskoka what I purchased on eBay. I'm not excited about the latest game console, nor am I prepared to brag about an autographed photo of my favorite celebrity icon. What I purchased is a vintage bottle of ant poison which surprisingly has never been opened. I would not want to consume the contents inside this vintage bottle of insecticide, nor would I ever want to use this product, but in reality we have all consumed the contents in this insecticide because the active ingredient is composed of 95% Sodium Fluoride. If you are curious as to why Sodium Fluoride is the active ingredient in a vintage bottle of ant poison, the answer is simple: because it has patents for it. Yes, Sodium Fluoride has patents for insecticides dating back to 1896 when Charles Henry HIGBEE patented the compounds of fluorine for the purpose of destroying insects. The bottle of Ant-Pizen I have states: "CAUTION This preparation contains sodium fluoride which is a deadly poison" It can be difficult to find such direct information regarding sodium fluoride as a poison, but it is a true fact. Sodium Fluoride is both a contact and a stomach poison; for this reason, most exterminators know the substance to work tremendously better on grown insects rather than larvae because adults have self cleaning habits which larvae do not. Needless to say, sodium fluoride does not sound safe for human consumption. A deadly poison & patented insecticide, Sodium Fluoride really is all this and more. How did public water supplies become vehicles for the delivery of a toxic substance which is dangerous to both our health and the environment as well? The truth is that sodium fluoride made it's way into public water supplies due to massive, if not astronomical, conflicts of interest. A report dating back to the Cold war (once classified for reasons of national security) brings to light very valuable information that we must all recognize. The report had been commissioned during the ultra-secret Manhattan project and was to assess the effect of fluoride on humans. Millions of tons of fluoride was essential in the production of bomb-grade uranium & plutonium. If the public had known that fluoride was one of the most toxic chemicals known and that fluoride was the leading chemical health hazard of the US atomic bomb program then it would have pulled the rug out from under the army. Big industries also play a role with conflicts of interest. Both the aluminum industry & phosphate mining operations also create toxic fluoride chemicals. These chemicals had at one time been released directly from smokestacks, but this was placed to an end when signs of environmental destruction became obvious. Upon well-deserved litigation, polluting corporations were forced to capture the highly toxic gaseous compounds which soon became accomplished with the installation of wet scrubber systems. Environmental destruction and pollution could now be avoided, but this came at a cost. Industries were now required to pay money for the proper disposal of their hazardous waste, that is until a money making miracle happened. Should it be of any surprise that the first suggestion to fluoridate water came from Francis C. Frary, a director of the aluminum laboratory for the aluminum company of America? Now big industries have the ability to not only waive costs for the proper disposal of their hazardous wastes, but they also make a profit by selling their waste as a premium product. Muskoka alone pays approximately $30,000 for these chemicals annually plus the addition of $13,200 in operational costs. It should also be known that the capital cost for the construction of the chemical feed system was in the order of $100,000. A money making miracle for big industries, but a misfortune for ourselves. Do not allow this crime to continue! Please partake in the surety of the safety of our water. Participate in the movement to end artificial water fluoridation which will directly benefit our health, our local environment and Muskoka's accounts.

Written by: Kyle O'Connor, Huntsville.
Contact: questionyourreality@hotmail.com


PIZEN
POISON
Active Ingredient
Sodium Fluoride
Inert Ingredients
100%
UNION DRUG CO., DISTRIBUTOR
CHICAGO, ILLINOIS


CAUTION
This preparation contains Sodium Fluoride which is a deadly poison
ANTIDOTE
Call Physician Immediately: Give at once large draughts of lime water or weak calcium chloride solution; stimulants of strong coffee or aromatic spirit of ammonia; artificial respiration; keep lower extremities and chest warm, digitalis hypodermically; 10 gr. calcium gluconate intravenously

Dilution is Not a Solution to Pollution

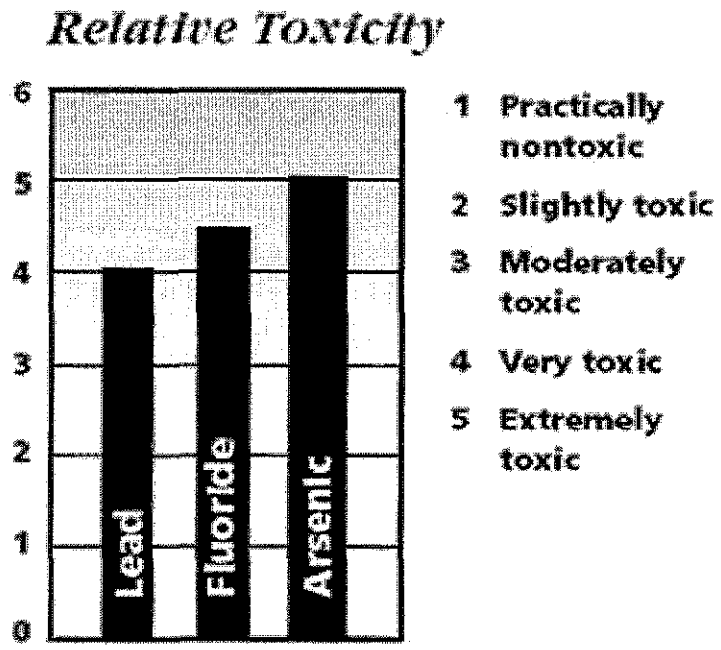
"Hazardous Waste"

Hazardous Waste Act

"Toxic Substance"

Canadian Environmental Protection Act:

- Bioaccumulative
- Toxic
- Anthropogenic
- Persistent



"Dangerous good/class 8 corrosive substance."

Transport Canada

Consider this:

- **It is Illegal to dump H_2SiF_6 anywhere in the environment!**
- **Health Canada failed to consider H_2SiF_6's long-term or combined effects on the environment, infrastructure or general health.**

Community Health Nurses' Initiatives Group

HNIG

February 29, 2012

Your Worship and members of Orillia Council

My name is Joyce Fox and I am a registered nurse. I am speaking to you this evening as a representative of the Community Health Nurses Initiatives Group, a specialty group with a membership of about 2000 community nurses who are members of the Registered Nurses Association of Ontario.

The Community Health Nurses Initiatives Group endorses fluoridation of the Orillia community water as an important measure to protect and enhance the health of local residents. As nurses we interact with people on a daily basis during which time they share with us the challenges they face and the strengths that support them to have a healthy life and a healthy family. It is from this perspective that I ask you to reflect on the impact of poor oral health on people's lives.

Think about the toddler who has decayed teeth and is in pain. He can not eat well because of this and is not as active as you would expect because of the pain. His cries in response to having poor oral health will only be silenced when he receives treatment – most likely though a lengthy process which may well involve hospitalization.

Think about the teen who is embarrassed by the way her mouth looks when she speaks or smiles. She isolates herself and does not engage with her peers even though peers are of utmost importance to her at this age.

Think about the parent who knows their child needs dental work but they can't afford to have the work done. They are in a low paying job and don't have access to paid time off work – so a dental appointment means lost wages as well as the cost of the treatment itself. The parent feels guilty about not being able to provide this care yet can't see any way to make it possible and still put food on the table for the family.

And think about the potential that you have to make a difference to these people's lives through supporting fluoridation of Orillia's water. You have a mandate as a municipal council to make decisions toward improving the quality of life for your residents.

The scientific information, established through systematic reviews of well conducted research, consistently identifies the benefits of fluoridation and no significant negative impacts. You can make a difference in the lives of those individuals that I have described. Based on the greater good for the citizens of this community and the positive change that you can bring to the health of your residents, I urge you to support fluoridation of the Orillia drinking water.

FOR YOUR INFO
DATE Mar. 1/12
TO P. Dance
J. Covey

Joyce Fox, RN, BScN, MHS
Community Health Nurses Initiatives Group
RNAO member, Huronia Chapter

JD Clerk's Dept

City of Orillia

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

The City of Orillia is interested in what you have to say about the potential fluoridation of the municipal water supply. Please take a moment to provide your comments and contact information below. Your input is important to us. Thank you for your participation.

PLEASE SUBMIT COMPLETED FORMS TO THE RECEPTION TABLE BEFORE LEAVING TONIGHT, OR BY FRIDAY, MARCH 30TH, 2012 TO:

City of Orillia
Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Kathryn Johnstone

Address: 119 Emily St. ON L3V 5V2

Phone: 705-326-8273 Email: yogabykathryn@gmail.com

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

I am a person opposed to fluoride.
My instinct has lead me to research exactly what fluoride is and how it can react in our minds and body.
As a young girl I was given topical fluoride treatments but was strongly told not to swallow it, it (fluoride) was poison and it would make me sick.
I have four children. I was told to give them fluoride drops by my doctor and dentist. I noticed something happening to the two older children's teeth. When I pointed it out to the professionals, they told me to get them off the fluoride drops. Two of my four children have dental fluorsis. As young adults they are still

(Continue on reverse)

trying to fix this. One of the children, though having fluoride treatments still had a couple of cavities.

I was a single mother, barely an income, but I still fed my children healthily and taught them proper nutrition and hygiene.

I do not feel fluoridating the water is going to fix the problem of cavities as is being suggested.

I believe and know educating and assisting those that need the help will be more beneficial.

Not putting hexafluorosilicic acid or any of the other fluoride variations into the water is what needs to happen. Putting these toxins in the water will lead to many other issues.

I would be happy to speak with you, more on this subject.

Thank You

Kathryn Johnstone
705-326-8273

City of Orillia

RECEIVED
MAR 16 2012
PUBLIC WORKS
AND ENGINEERING

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

The City of Orillia is interested in what you have to say about the potential fluoridation of the municipal water supply. Please take a moment to provide your comments and contact information below. Your input is important to us. Thank you for your participation.

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Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Anne Selby

Address: 4 Jordan Cres.

Phone: (705) 327-8647 Email:

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

I am totally opposed to fluoridation. NO
One has the right to poison my water. I have
grave doubts about the recommendation of a Dentist
Suggesting fluoridation to protect Children teeth. I would
like to see his credentials, How about a healthy diet
for children, fruit vegetables etc. I grew up in England
during the Second World War. We were poshioned but
there was NO access to fast food or sugar heavy
drinks. I never had a cavity while I was 17 years.
We were taught to eat the healthy food Mother Made &
brush our teeth after every Meal Plus Bettle Candy
was allowed. It too was rationed

(Continue on reverse)

City of Orillia

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

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City of Orillia
Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Julie Ward

Address: 90 Dallas St Apt C

Phone: 705-259-3009 Email: —

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

- Not good for the new born babies that are being born because they don't even have teeth yet and if they drink the water than their future they are going to die before their parents. (Buy getting cancer or some thing new that's not even out yet like diseases ect...

- There babies are not used of this if they drink our flouride water

(Continue on reverse)

malady, because what might happen in their future of their body.

- [redacted] have our water is the most water we have in the world by the South Americans and if we put flouride in our water we are just going to make every body sick and we will even be supplying every body else in the world and eventually they will get sick as well in the future so I think you should not put flouride into our water just thinking about the future of the babies that are not even born yet. If we didn't need it before why play with something that we really don't need get the parents not to be so lazy and get there kids up and brush their teeth simple

(don't be so lazy)

get your kids to brush and floss (just get them to do it [redacted] old school)

City of Orillia

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

The City of Orillia is interested in what you have to say about the potential fluoridation of the municipal water supply. Please take a moment to provide your comments and contact information below. Your input is important to us. Thank you for your participation.

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City of Orillia
Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: ShawnaSpeerin

Address: 405 S Rosemary Rd Orillia ON L3V3P6

Phone: 705 326-8686 Email: shawna.speerin@hotmail.ca

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

I have done some research on the fluoridation of water. I did not find any benefits to fluoridating Orillias water only negative outcomes. There are many negative outcomes to the fluoridation such as risk of osteosarcoma, premature aging and many other negative side effects. It would be a disgrace and horribly shameful if orillias water was fluoridated putting everyone at risk.

(Continue on reverse)

City of Orillia

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

The City of Orillia is interested in what you have to say about the potential fluoridation of the municipal water supply. Please take a moment to provide your comments and contact information below. Your input is important to us. Thank you for your participation.

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City of Orillia
Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Danielle Bennett Walsh

Address: 861 Hwy 11 S, Orillia, L3V 6H3

Phone: 705-321-1317 Email: bennett_26@hotmail.com

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

I don't beleive water fluoridation is best for Orillia. I would rather pay to have my teeth pulled then to drink fluoride in my water on a daily basis. There are many health risks to fluoridating our water. Bone cancer, bone weakening etc. I don't understand why The City of Orillia wants to fluoridate our water when other cities are working to remove the fluoride in their cities water. Water fluoridation would be counter-productive for the city considering the health risks that will undoubtably become issues if this proposal is passed.

Danielle Bennett Walsh

(Continue on reverse)

City of Orillia

City of Orillia
Public Consultation on Community Water Fluoridation
Public Forum – February 29th, 2012

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City of Orillia
Public Works Department
50 Andrew Street South, Suite 300
Orillia, Ontario L3V 7T5
Attention: Jason Covey, Water/Wastewater Engineer
Phone: (705) 325-2227 Fax: (705) 329-2670
Email: jcovey@orillia.ca

Name: Sherri Ciric

Address: 220 Colborne ST W #1

Phone: 323 9906 Email: SherriSherri1@hotmail.com

PLEASE PROVIDE YOUR COMMENTS, QUESTIONS, ETC.:

Flouridating the water is a bad idea, there is to many risks involved with Flouridating the water. Is it worth risking our children, just because of tooth decay. Research says that Children, that are exposed to high levels of fluoride, have lower IQ's. IT IS NOT WORTH IT.

(Continue on reverse)

From: Kelly Clune [mailto:wastereductionservices@yahoo.com]
Sent: Thursday, March 01, 2012 12:51 AM
To: MAYOR EMAIL; Patrick Kehoe; Michael Fogarty; Andrew Hill; Linda Murray; Pete Bowen; Paul Spears; Tony Madden
Subject: Hot off the press NEWS: Windsor stops fluoridating water and supports full debate.

FYI - News Re: City of Windsor

"Utilities commission recommends city council stop fluoridating water, requests more information so city can have full debate."

http://blogs.windsorstar.com/2012/02/29/utilities-commission-hears-presentations-from-experts-public-on-water-fluoridation/

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of albert.greer@rogers.com
Sent: Friday, March 02, 2012 3:56 PM
To: JASON COVEY
Subject: fluoridation of water

I wish to state on record that I am in favour of the fluoridation of the Orillia water supply. I am aware that fluoridation is a proven method of reducing tooth decay.

From: Kelly Clune [mailto:wastereductionservices@yahoo.com]
Sent: Friday, March 02, 2012 10:03 PM
To: MAYOR EMAIL; Gayle Jackson
Cc: Patrick Kehoe; Michael Fogarty; Linda Murray; Andrew Hill; Paul Spears; Pete Bowen; Tony Madden; JASON COVEY
Subject: Request for Information Forum

325 Peter St. N.
Orillia, ON L3V 5A4

March 2, 2012

City of Orillia
Mayor and Council
50 Andrew St. S.
Orillia, ON L3V 7T5

Open letter to Mayor Orsi and Members of Council,

Re: Public information process - Water Fluoridation

Thank you for the opportunity to present some of my concerns regarding water fluoridation at the public meeting on February 29th, 2012. It was unfortunate that only four of eight Council members were able to attend.

I have a few questions about this meeting:
1. Why were experts opposed to water fluoridation not invited to present alongside Health Canada, during the initial portion of this public meeting?
2. Since one of the objectives of this meeting was to allow citizens the opportunity “to be heard”, why were councilors not present to hear comments from constituents?
3. Why were no questions or interactions allowed from the audience to presenters and/or to health officials?

On September 12, 2011 Council developed a process with the following objectives:
• Provide Council with unbiased and factual information about fluoridation.
• Raise the level of awareness about fluoridation among the citizens of Orillia.
• Provide an opportunity for citizens of Orillia to hear about and be heard about fluoridation.
• Achieve an open and transparent consultative process that will respect and address the views and

concerns of the citizens of Orillia.

Since June 2011, Council has heard from health officials in favour of water fluoridation. When were experts opposing fluoridation consulted, and what are the names and credentials of those experts? I hope you will agree that in order to reach a fully informed decision, both sides of the issue need to be heard, in a fair and open forum. Orillia's next public meeting on water fluoridation is not until May 29th, 2012, at which time recommendations will be made by staff.

Therefore, to meet Council's stated objectives, will you work with interested citizens to arrange an open debate on water fluoridation? By inviting three experts opposed to water fluoridation, and three experts in favour of adding fluoride to our water, an informative discussion and question period will evolve, which help to ensure that we all become better informed about fluoride, and that we identify all possible strategies to address poor dental health in our community.

This forum will allow an opportunity to gather "unbiased and factual information about fluoridation", and for Council members to hear from the people they represent. If it is possible to extend the information deadline from March 30 to a later date, this forum could be held in April or early May, allowing time to arrange schedules and confirm attendance, as well as ensure that information, from the forum, is included in the public record.

I look forward to hearing from you soon.

Thank you,

Kelly Clune

cc. Jason Covey, Water & Wastewater Engineer - City of Orillia Public Works Department
For public record of fluoridation issue.

8 Watson Court
Orillia L3V 7S5
Ontario
db.mallinson@gmail.com

March 2, 2012

Dear Mayor and Councillors,

I attended the public meeting about water fluoridation in the Orillia Council Chambers on Wednesday evening, and found that it left me in a pensive mood. Both sides of the debate try to use statistics to back up their claims, and the discussion becomes a more sophisticated version of the childish " 'Tis so! 'Tis not!" exchange.

However, what is clear from the presentations made is that:

a) The chemical used to fluoridate water (sodium silicofluoride) is a highly toxic sludge that is an industrial by-product that was originally a problem looking for a solution. The solution found was to use it in municipal water fluoridation, and to sell it as a product when it should have been processed as toxic waste. Apart from the fluoride in it, there are traces of lead and arsenic, substances that are deemed to have similar toxicity to fluoride. It is also extremely hazardous and corrosive for municipal water workers to handle.

b) The proponents of fluoridation stress and exaggerate the questionable benefits of fluoride in strengthening teeth, but have nothing to say about the side effects of the other toxins in sodium silicofluoride, a product that is not even of pharmaceutical quality. Much of the research to date indicates that topical application of fluoride to teeth may have some benefit, but that ingestion of fluoride has none. In fact, the instructions on tubes of fluoridated toothpaste warn against swallowing any of the product.

c) The problems with dental decay being experienced by some people in Orillia are the result of serious socio-economic factors, specifically low income, poor diet (caused by lack of education and/or the inability to buy healthy food as a result of poverty or near-poverty) and poor dental care and hygiene. The same causative factors are evident in many other medical problems such as diabetes and obesity that also affect Orillia's poorer citizens. Tooth decay is therefore just one of the many problems being experienced by this segment of the population.

d) The administering of what amounts to an unregulated drug to the population as a whole flies in the face of usual medical practice, when there is no assessment of the needs of the individual "patients" or any attempt to determine and control appropriate individual doses. There is also no examination of the possible side effects on persons who may be sensitive to the drug. Proponents of fluoridation point to other examples of the mass use of substances such as chlorine to purify municipal water, or iodine in salt to counter goitres, but these can't be compared. Chlorine can be removed from water by letting the water stand, and anyone

wanting to avoid iodine can buy non-iodized salt. The cost of non-fluoridated water for drinking and bathing, however, is prohibitive.

Dr. Keith Morley shocked us all with the pictures of tooth decay in a small child he had treated. While feeling a great deal of sympathy for the child, we were not told anything about the child's socio-economic background, whether he lived in a non-fluoridated area, or the possible causes of the decay. It is altogether likely that poor diet and poor dental hygiene and practices were at the root of the problems, and that fluoridation would have had little bearing on his plight. There are many children, after all, who live in non-fluoridated areas, and who do not suffer from the same appalling decay.

In summary, fluoridation is a practice that takes a shotgun approach that (all too literally) peppers us all with lead and other toxins. What is needed is a targeted approach to improving the health of a needy segment of the population through education and financial assistance, and that addresses more than the single issue of tooth decay. It would be far better to spend money on providing diet and dental hygiene education, toothbrushes, fluoridated toothpaste and financial assistance to low-income families than subjecting us all to a questionable "cheap and simple" unfocused remedy.

I request that council agree to an open forum debate with experts on both sides participating, and which is open to the general public. People need to have the opportunity to ask questions and to get answers in order to develop an informed opinion about the proposal to fluoridate our water.

Regards,

David Mallinson.

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Monday, March 05, 2012 2:46 PM
To: Dr. Charles Gardner
Cc: Andrew Hill; Linda Murray; MAYOR EMAIL; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden
Subject: Policy on Fluoride - Canadian Dental Association
Importance: High

March 5, 2012

Dr. Charles Gardner
Medical Officer of Health
Simcoe County District Health Unit

Dr. Gardner:

RE: Community Water Fluoridation for Orillia
CDA Policy Statement on Fluoride

The Canadian Dental Association Policy Statement on Fluoride, http://www.cda-adc.ca/_files/position_statements/Fluorides-English-2010-06-08.pdf
raises concerns and questions.

"The availability of fluorides from a variety of sources must be taken into account before embarking on a specific course of fluoride delivery to either populations or individual patients. This is particularly important for children under the age of six, where exposure to more fluoride than is required to simply prevent dental caries can cause dental fluorosis. Provided that the total daily intake of fluoride is carefully monitored, fluoride is considered to be a most important health measure in maintaining oral health for all Canadians.
CDA recognizes the need to monitor the scientific literature with respect to levels of exposure to fluoride and general health to ensure the continued safe and effective use of fluorides in dentistry." Revised April 2010

Dr. Gardner, my questions:

1. How does anyone know what amount of fluoride each individual in Orillia is presently receiving in order to take it "into account "?
"The availability of fluorides from a variety of sources must be taken into account before embarking on a specific course of fluoride delivery to either populations or individual patients."
We know that all of us are exposed to fluoride through the food we eat, beverages we buy which may be made with fluoridated water, (pop, juice), dental products, tea, pesticide residues on food etc. The amount of fluoride in each item is not identified on labels, beverages, food etc.

2. Personally, I have no idea of the amount of fluoride I am ingesting. Since CWF would increase the amount of fluoride each individual ingests and absorbs, how could anyone ensure that any additional amount is safe?

3. Since the amount of fluoride ingestion is currently unknown for each individual, how can "the total daily intake of fluoride be carefully monitored" as outlined in the CDA Policy Statement? Provided that the total daily intake of fluoride is carefully monitored, fluoride is considered to be a most important health measure in maintaining oral health for all Canadians."

I await your reply.
M.C. O'Neill

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Monday, March 05, 2012 7:00 PM
To: JASON COVEY
Subject: Susan Schweitzer - Fluoridation Submissions To Orillia Process

Hi, Jason, I am still working on getting more contact info to you, per our conversation of the end of last week, for the experts. I have contacted several, but I need to have them approve how they want to be contacted by you. In the meantime, I have attached some interesting information, and I am submitting it for inclusion in the Orillia process.
The Windsor Utilities Commission voted in favour of recommending to city council to stop water fluoridation for five years and redirecting any funds recuperated into oral hygiene and nutrition education. This happened on Feb. 29th, 2012. One attachment is the content of one of the speeches given the night of that vote.
Also, I have attached the content of my comment, from Feb. 29th. As far as I know, there was not one person from city council in the room, when I made my comment. I have attached the original letter, on which I based my comment, also. I am submitting both to be added to the Orillia process.
Thanks, Jason.
Susan Schweitzer 329-4908

Good evening, everyone. My name is Susan Schweitzer.
I request that Orillia City Council exercise due diligence by following the example of Peel Regional Council, a Council that governs 1.3 million people:
The Council sent a letter to the Ontario Minister of Health as follows:
I am writing to advise that Peel Regional Council approved the following resolution at its meeting held on **January 12, 2012**:
"That the Region of Peel request that Health Canada regulate the fluorosilicates hexafluorosilicic acid and sodium silicofluoride, used as a treatment for dental cavities in drinking water, **as drugs**, under the Food and Drugs Act;
And further, that all chemicals, especially fluorosilicates, added to drinking water for the purpose of treating dental decay, **undergo new drug applications** and be **assigned drug numbers** by Health Canada;
And further, that classification of fluorosilicates as drugs shall be based on **at least one long-term toxicology study to determine health effects in humans;**
And further, that **at least one properly conducted, double blinded, randomized placebo controlled clinical trial be used to provide effectiveness as the basis for the new drug classification**;
And further, that the Region of Peel make the above recommendations to Health Canada to **reassure the citizens** of Peel that the use of fluorosilicates added to drinking water for the purpose of treating dental decay **is safe** and what the **health effects** are;"
Until Orillia City Council does what Peel Regional Council has done, and until Health Canada does everything Orillia City Council requests, **please**, **postpone** the vote.
Thank you, everyone.

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Monday, March 05, 2012 10:21 PM
To: JASON COVEY
Subject: Susan Schweitzer

Jason, more material for the Orillia process:

DENTAL FLUOROSIS VS. IQ OF CHILDREN OF BAGALKOT DISTRICT, INDIA
RELATION BETWEEN DENTAL FLUOROSIS AND INTELLIGENCE QUOTIENT IN SCHOOL CHILDREN

OF BAGALKOT DISTRICT
This study was conducted on 160 children, aged 7–11 years, in the Bagalkot district of Karnataka state, India, between August and October 2010, with the aim of determining if a relationship exists between the degree of dental fluorosis and scores on Intelligence Quotient (IQ) tests. Among 120 randomly sampled and examined children of the Bagalkot taluk (water fluoride = 0.5 ppm), 80 children without dental fluorosis were selected for the study. They were compared to a selection (based upon the presence of dental fluorosis) among 80 (of 150 randomly sampled and examined) children of the Hungund taluk (water fluoride 2.5–3.5 ppm). Intelligence testing was done using the Raven's Coloured Progressive Matrices. The following observations were derived from the data. The mean IQ score of children without dental fluorosis (76.36 ± 20.84) was significantly higher (P = 0.0019) than that of children with dental fluorosis (66.62 ± 18.09). The mean IQ scores did not vary with the severity of dental fluorosis as classified by Dean's fluorosis index. It was also found that a higher percentage of children with dental fluorosis was in the "Extremely Low" and "Low" IQ categories, whereas a higher percentage of children without dental fluorosis was in the "Average" and "High Average" IQ categories. Table 1 of the paper reveals the largest effect among female children (64.36 ± 19.94 vs. 78.29 ± 17.36, with and without dental fluorosis, respectively; P = 0.0032), whereas among males the effect was smaller (68.67 ± 16.21 vs. 75.14 ± 22.86; P = 0.1285). Previous studies have indicated decreased intelligence in children exposed to high levels of fluoride, and our study confirms such an effect.
Authors: Shivaprakash PK, Ohri K, Noorani H.
Correspondence: P K Shivaprakash, Department of Pediatric and Preventive Dentistry, P. M. N. M. Dental College, Bagalkot - 587 101, Karnataka, India.
Keywords: Dental fluorosis; Groundwater fluoride; Intelligence quotient.
Source: J Indian Soc Pedod Prev Dent [serial online] 2011; 29:117-20. Available from: http://www.jisppd.com/

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of joannewatson@rogers.com
Sent: Wednesday, March 07, 2012 11:03 AM
To: JASON COVEY
Subject: Proposed water fluoridation - City of Orillia

I am registering my strong vote against Fluoridation of water in the City of Orillia. My adult son is also against Fluoridation. Please relay the message that council does not have the right to negatively affect my health, nor to interfere in anyone's health. Thank you for your attention.

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Wednesday, March 07, 2012 1:30 PM
To: JASON COVEY
Subject: Re: Susan Schweitzer - Fluoridation Submissions To Orillia Process

Hi, Jason, I am greatly dismayed by the "public consultation" page, to which you refer, on the City of Orillia website. The city has already partnered with the "yes" side (Public Health and Health Canada) to bring this forward, as stated right on the page, so how can anyone say that anything to do with the process is "unbiased"? Also, the information presented on that page, concerning fluoride and fluoridation, is one-sided and biased. It does not account for the "no" side science and arguments, and there are plenty, that would refute the claims made on that page. As well, it does not cover the human rights and legal sides of fluoridating water at all.
Please, add my questions and comments, above, to the submissions to the water fluoridation "process", and, please, have someone respond to me, in writing, in answer to my questions and concerns, as soon as possible. Thanks, again.
Susan

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Wednesday, March 07, 2012 1:35 PM
To: JASON COVEY
Subject: Re: Susan Schweitzer - Fluoridation Submissions To Orillia Process

Jason, for the second public forum, in May, do I have to register to speak? If yes, what are the particulars of that? Thank you, Susan

---

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of bambiz@sympatico.ca
Sent: Thursday, March 08, 2012 8:47 PM
To: JASON COVEY
Subject: fluoridation of water

I am in favour of this project as it would improve the dental health of Orillia residents.

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of bambams@sympatico.ca
Sent: Thursday, March 08, 2012 9:09 PM
To: JASON COVEY
Subject: fluoridation of city water

I am in favor of adding fluoride to city water to improve the dental health of Orillia residents.

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Thursday, March 08, 2012 10:20 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; mforgarty@bell.blackberry.net; Paul Spears; Pete Bowen; Tony Madden
Subject: You do not have my consent to put fluoride in Orillia water

There are numerous reasons to not do this, but a very good one is that in cities that have done this, after only two years, cancer rates go up by 30% and hip fracture rates DOUBLE!

IF YOU PUT FLUORIDE IN THE WATER - YOU WILL HURT PEOPLE!

Steve

From: dianne orton [mailto:diniii@distributel.net]
Sent: Wednesday, March 07, 2012 10:49 PM
To: Jason Covey
Cc: MAYOR EMAIL; Gayle Jackson; Michael Fogarty; Andrew Hill; Paul Spears; Linda Murray; Patrick Kehoe; Tony Madden; Pete Bowen
Subject: WUC Admin Advise Source of Fluoride in Drinking Water - YouTube

Hi Jason: Please watch!

The 7minutes and 10 seconds it will take to watch these two vids will truly enlighten you.

http://www.youtube.com/watch?NR=1&v=qZ2GKw6zgPw&feature=endscreen 4:47 min Windsor, Ontario

http://www.youtube.com/watch?feature=endscreen&NR=1&v=UKFuChX1YI8 2:23 minutes, Windsor, Ontario

---

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Thursday, March 08, 2012 11:04 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; mforgarty@bell.blackberry.net; Paul Spears; Pete Bowen; Tony Madden
Subject: See list of communities - all rejected fluoride - why?

Please research the reasons that fluoride is being rejected all across North America.

WHY HAVE THESE CITIES/COMMUNITIES REJECTED FLUORIDATION?

Canadian communities that have rejected or ceased fluoridation in the last twenty years are listed below:

Campbell River, British Columbia (April 1993, after 33 years of fluoridation)
Port Hardy, British Columbia (November 1993, after 19 years of fluoridation)
Kelowna, British Columbia (November 1996, after 42 years of fluoridation)
Kitmat, British Columbia (March 1998)
Whitehorse, Yukon Territory (July 1998, after 30 years of fluoridation)
Meadow Lake, Saskatchewan (July 2011)
Kamloops, British Columbia (October 2001)
Cobalt, Ontario (December 2001)
Dutton-Dunwich, Ontario (June 2003)
Comox/Courtenay, British Columbia (February 1992)
West Elgin, Ontario (June 2003)
Dieppe, New Brunswick (December 2011)
Burns Lake, British Columbia (June 2003)
Golden, British Columbia (November 2005)
Welland, Pelham, and Thorold, Ontario (February 2008)
Dryden, Ontario (April 2008)
Quebec City, Quebec (April 2008, after 36 years of fluoridation)
Drayton Valley, Alberta (December 2008)
Cranberry Portage, Manitoba (January 2009)
Squamish, British Columbia (November 1993, after 20 years of fluoridation)
Gatineau, Québec (May 2010)
Waterloo, St. Jacobs and Elmira, Ontario (October 2010)
Calgary, Alberta (February 2011)
Taber, Alberta (July 2011)
Slave Lake, Alberta (September 2011)
Churchill, Manitoba (October 2011)
Lake Cowichan, British Columbia (November 2011)
Williams Lake, British Columbia (November 2011)
Moncton, New Brunswick (December 2011)
Amherstburg, Ontario (February 2012)

… 13 of these have been in the last year

… and Windsor, Ontario – just last week – Feb 29/12 to be exact!!!!

In the United States alone, there is a similar list of over 250 communities that have rejected fluoridation in the last 20 years.

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Friday, March 09, 2012 9:30 PM
To: JASON COVEY
Subject: Re: Susan Schweitzer - Fluoridation Submissions To Orillia Process

Jason, I do understand the positions and the Council directive (I read it.). I am saying that the city can't hope to call the process unbiased when the "foxes are 'assisting' with the hen house". So, someone from your office or City Council needs to address this fact. You are getting "assistance" from the pro fluoridation side of the issue. That means that every part of the process is flawed. Once again, how is this process unbiased, given that fact? Please, have someone respond to me with an answer to that, and please, submit what I have written, here, to the process regarding fluoridation. Thank you, Susan

-----Original Message-----
From: Scott Miller <scott.miller.3@gmail.com>
Date: Fri, 9 Mar 2012 14:52:19
To: <jcovey@orillia.ca>
Cc: <mfogarty@bell.blackberry.net>; <mayor@orillia.ca>; <linda.murray170@gmail.com>; <andrew.hill@bell.net>; <pat@kehoeassociates.ca>; <pcvc@sympatico.ca>; <petebowen12@gmail.com>; <tonymadden@rogers.com>
Subject: Orillia Information Page About Fluoridation ~ Very Disappointing

Mr. Jason Covey and Orillia City Councillors,

I am writing regarding this webpage: http://www.orillia.ca/en/livinginorillia/Fluoridation.asp

It states on this page and I quote,

"The objectives of the public consultation process are to:
* Provide Council with unbiased and factual information about fluoridation.
* Raise the level of awareness about fluoridation <http://www.orillia.ca/en/livinginorillia/Fluoridation.asp#FAQF> among the citizens of Orillia.
* Provide an opportunity for citizens of Orillia to hear about and be heard about fluoridation.
* Achieve an open and transparent consultative process that will respect and address the views and concerns of the citizens of Orillia."

The information that follows is only the Yes side of water fluoridation. What happened to providing an opportunity for citizens to hear unbiased information on fluoridation? For those who could not make it to the public forum and arrive on your info page, they are not getting the unbiased story.

Your information page is Not "open and transparent". It does Not "respect and address the views and concerns of the citizens of Orillia."

For example, where is the issue of cancer causing arsenic addressed and explained?

According to the National Science Foundation, the most common contaminant found in hydrofluorosilicic acid is ARSENIC. The World Health Organization, Food and Drug Administration and the Environmental Protection Agency all agree and classify arsenic as "carcinogenic to humans". In other words, ~ Arsenic ~ Causes ~ Cancer.

http://www.fluoridealert.org/f-arsenic.htm
http://www.cancer.org/Cancer/CancerCauses/OtherCarcinogens/IntheWorkplace/arsenic
http://www.slweb.org/oralhealth.america.html

I urge you to 100% balance your information webpage with recent facts and studies regarding how fluoride can injure people. Why not start with adding this truth:

97% of Western Europe is fluoride free and in the past 2 years, 15 municipalities across Canada have listened to their citizens and Stopped Fluoridating their Water Supplies.

Thank you.

Sincerely,

Scott Miller
Orillia Citizens for Safe and Clean Drinking Water
"The first wealth is health" - Ralph Waldo Emerson

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of upperca@rogers.com
Sent: Saturday, March 10, 2012 11:40 AM
To: MAYOR EMAIL
Subject: Water Quality

After being up since 3Am I drove back to Orillia from Brock U.in St. Catharines to attend the public meeting on fluoridation at city hall. This was after working all day for E.S. Fox Constructors building the new health research facility I was planning to speak to the issue. I noticed you and others left before hearing some members of the public present their concerns. My issue and that of some others is sensitivity to chemicals. The other issue I have is the as yet unknown effects such as the affect on the brain. Thankfully the city of Welland where I grew up had the financial sense to discontinue the practice although due to the cost to repair the equipment. Niagara Region has stopped it. The fact is you can't reach the children who live outside the city water supply and the health officials are not being truthful about the issue as a whole. If implemented my wife and I will be forced to leave Orillia the place we just moved to to get away from toxic pollution. This is a beautiful city with plenty going for it and a subject such as this could blow up into a marketing problem.Please watch these youtube videos if you haven't seen them and please pass them on to your council.Thank You for your time.

http://www.youtube.com/watch?v=LEZ15m-D_n8&feature=related

http://www.youtube.com/watch?feature=player_embedded&v=fHga-8m3Srg

James D. Upper
46-337 West St. N.
705-259-1096
upperca@rogers.com

From: David Mallinson [mailto:db.mallinson@gmail.com]
Sent: Sunday, March 11, 2012 12:01 PM
To: JASON COVEY
Subject: Re: City of Orillia Public Consultation on Fluoridation

Dear Mr. Covey,

Thank you once again for your reply. Just to let you know, another Canadian community, Windsor, Ontario, decided to end fluoridation last week. You may want to add this one to the list I have already provided.

Regards,
David.

From: lostrin [mailto:lostrin@gmail.com]
Sent: Sunday, March 11, 2012 7:03 PM
To: JASON COVEY
Subject: suggestion for fluoride page

Dear Jason,

Just a suggestion to make the fluoride page on the city's website more balanced:

Advocates say:

• The incidence of tooth decay is reduced among the population when fluoride is added to drinking water.

• Levels of fluoride found naturally in some water sources is far higher than the levels that would be added to prevent tooth decay.

• Many studies show no adverse health or environmental effects linked to fluoridation of drinking water.

Opponents say:

• Some studies show a statistically significant link between exposure to high levels of fluoride and detrimental health effects such as increased risk of bone fractures, reduction of thyroid function, reduced IQ, bone cancer, and tooth discolouration.

• It's not necessary to expose the entire body to fluoride through ingestion because its positive effects come from its application to teeth, and fluoride-containing toothpastes are readily available.

I know you would want to appear balanced during this period of public consultation. The current page should offer both sides of the issue, please.

Kind regards,
Janet

Clean Water is fluoride free

From: Bruce Spittle [mailto:spittle@es.co.nz]
Sent: Saturday, March 10, 2012 10:29 PM
To: MAYOR EMAIL
Cc: Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden; JASON COVEY
Subject: Water fluoridation in Orillia

727 Brighton Road
Ocean View
Dunedin 9035
New Zealand

Telephone/Fax +64 3 4811418

11 March 2012

Angelo Orsi, Mayor
Orillia, Ontario, Canada

Dear Mr Orsi

My I express please my view that fluoridation of the Orillia water supplies would carry a risk of fluoride neurotoxicity.

From a pool of eight studies, the urinary fluoride (F) levels associated with F neurotoxicity is 2.5 mg F/L or more. When, as is customary in determining safe levels for toxic substances, a safety or uncertainty factor of ten is used to allow for variations in F absorption, differences in water consumption and factors that increase the sensitivity to F toxicity such as low iodine levels, a value for the level of urinary F level unlikely to be associated with neurotoxicity is obtained of 0.25 mg F/L. From seven of the control areas in the eight studies, it can be estimated that the drinking water F level likely to produce a urinary F level of 0.25 mg F/L is 0.10 mg F/L. (No water F values were available for one study which considered F from clay-coal smoke).

A further 2011 study by Ding et al. looking at IQ in children with drinking water F in the range 0.24 – 2.84 mg F/L, mean 1.31 mg F/L, found a negative correlation between urine F and IQ when age was taken into account. Their study

suggested that although the IQ began to fall below the mean with a drinking water F of 0.81 mg F/L, there was no threshold and that the IQ would be 0.42 higher with a drinking water F of 0.10 mg F/L compared to the IQ at a drinking water F of 0.81 mg F/L. Thus, rather than applying a safety factor of ten and obtaining an estimate of the level of F in drinking water that is likely to protect against neurotoxicity of 0.081 mg F/L, the Ding et al. study suggests that there is no threshold for F neurotoxicity from F in drinking water and that the only assuredly safe level is zero. (References in Fluoride 2011;44(3):117-124; available at www.fluorideresearch.org)

Thus the information currently available does not provide any reassurance that water fluoridation in Orillia would not carry a risk of causing fluoride neurotoxicity

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-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of aaron.j.switzer@gmail.com
Sent: Monday, March 12, 2012 2:06 PM
To: JASON COVEY
Subject: Speaking at the Public Forum on May 29/12

Dear: Mr. Jason Covey,
I am writing you to request the opportunity to speak before Orillia City Council at the second public forum on May 29th 2012 regarding report no. PW-09-036 "Fluoridation of City Drinking Water."
I will be preparing a small speech/presentation on behalf of low-income families with young children on this issue. I am a single father with a one and a half year old son and belong to the low income demographic. I would like to present my position on this issue on behalf of both parents of young children as well as low income families; both of which have been mentioned during past debates on this topic.
I thank you for your consideration to speak before council and await your reply.
Sincerely,
Aaron Switzer
(Note: this request has been filed both electronically and in writing to 50 Andrew St. S., Suite 300)

A petition started on Change.org, viewable at http://www.change.org/petitions/protect-our-water.

Sent: March 13 - 30, 2012
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors,

Vote against fluoridating Orillia's water supply.

Thank you!

1. Gary Vamplew, **Orillia, Canada**
2. Alistair Bjork, Huntsville, Canada
3. Brenda Doucette, Gravenhurst, Canada
4. Lynn Watt, Toronto, Canada
5. Sheila Miller, Stoney Creek, Canada
6. Karyn Reed, Rama, Canada
7. Kathleen Patterson, **Orillia, Canada**
8. Victoria Heide, Blairmore, Canada
9. Barbara Finn, Richfield, Minnesota
10. Sonja Pusnik, Slovenska Bistrica, Slovenia
11. Ann Childers, Lake Oswego, Oregon
12. Brian Ward, **Orillia, Canada**

13. Sherry Smith, **Orillia, Canada**
14. Laura Elson, **Orillia, Canada**
15. Candice O'Connor, Huntsville, Canada
16. Doug Worsley, Barrie, Canada
17. Jack and Janet Tarasoff, Calgary, Canada
18. Alice Dowswell, Coldwater, Canada
19. Jane Schweitzer, Hamilton, Canada
20. Vita Rubino, ON, Canada
21. Cindy Hanson, **Orillia, Canada**
22. Marguerite Thibaudeau, Sudbury, Canada
23. Edward Laurson, Denver, Colorado
24. Gene Valois, **Orillia, Canada**
25. Virginia Mccoy, Mimbres, New Mexico
26. Scott Miller, **Orillia, Canada**
27. Kallie Miller, London, ON, Canada (2)
    - I sign because I don't want my countryman to be drinking water with a chemical added that has no toxicological testing done for long term use. Hydrofluorosilicic acid is a toxic waste that cannot be put in the air or water in Florida yet is trucked all around North America to be put into humans used as toxic waste disposal units. Fluoridation is ineffective unsafe and immoral. Mass medication without informed consent, dose control and unregualated. Due your due diligence. Ask to see the safety studies. No certificates accepted.

28. Lynne Lorette, Victoria Harbour, Canada
29. Lukas Martinelli, Pleasant Hill, California
30. Donna Mayne, Windsor, California
31. Kathryn Johnstone, **Orillia, Canada**
32. Erika Rikhiram, Clermont, Florida
33. Ruth Bednar, Gravenhurst, Canada
    - Hydrofluorosalicic acid (the industrial chemical added to fluoridate community water) is 80 times more toxic than calcium fluoride. This industrial chemical also contains other carcinogenic chemicals, such as arsenic as this fluoride is NOT pharmaceutical grade. The Medical Officers of Health are leading us to believe they are just topping up calcium fluoride found naturally in water supplies. We are now consuming 300% more fluoride than 50 years ago (see Fluoride Glut) as it is found in all processed beverages, wine, beer, and pesticide laden food. Fluoride is NOT listed on any food labels and no one knows how much they are ingesting. Dental fluorosis, a clear sign of fluoride poisoning has also increased three fold in the last 50 years. NO ONE takes responsibility for the safety of this artificial fluoridating chemical. The NSF has a disclaimer, everyone should know about, that even protects them from any liability regarding the safety of this chemical. Don't be fooled by the half truths and propaganda trying to protect this cummulative poison.

34. Yasiu Kruszynski, Chicago, Illinois
35. Mark Buckland, **Orillia, Canada**
36. Alex Draper, **Orillia, Canada**
37. Jodie Henderson, **Orillia, Canada**
38. Marion Hurlimann, Oro-Medonte, Canada
39. Lynn Martin, **Orillia, Canada**
40. Valerie Harmsworth, **Orillia, Canada** (2)
    - Artifically fluoridating water has been linked to to many health issues as it accumulates in the the bones and soft tissue of the body. If there is even a chance it will cause problems, why even CONSIDER it's use? I think it's insanity.

41. Blaine Eisler, **Orillia, Canada** (2)
42. Meredith Warboys, **Orillia, Canada** (2)
    - I believe that good nutrition should be the focus - not subjecting everyone to something that not everyone wants. People should have a choice. There are free programs out there for families who aren't able to afford dental care.

43. Judith Abel, Basel, Switzerland (2)
44. Domenic Disano, **Orillia, Canada** (2)
    - Fluoride in the water does not prevent cavities and is poisonous.

45. Justyna Lasocka-Miller, **Orillia, Canada** (2)
46. Nicole de Laplante, **Orillia, Canada** (2)
47. Az Ashburn, Subang Jaya, Malaysia (2)
48. Kim DeYong, Windsor, Ohio (2)
49. Linda McDowell, Coldwater, Canada (2)
50. Jim Bjork, Huntsville, Canada
51. Bruce Miller, **Orillia, Canada**
    - Clearly the fertilizer industry has the resources and the urgent need to market and lobby for a solution to their dilemma of finding a way to dispose of a toxic by-product that by law does not allow them to place it any ocean, lake or water body of any kind. Municipalities around the world would be subject to this relentless pressure from the fertilizer industry. The Municipality of Orillia and those in Simcoe County that are directing the proposal are apparently subject to this pressure and appear willing to accept it. The points made in the petition speak for themselves and are more than adequately supported by the references. Best way to improve oral hygiene is through the credible education system at all levels where the facility and infrastucture is already in place.

52. Shawna Snache, Rama, Canada
53. James Beck, Calgary, Canada

- Fluoridation is ineffective, unsafe and unethical.

54. Denise Smith, **Orillia, Canada**
55. David Boothman, St Simons Island, Georgia

- It is unethical to continue a practice once it is known to be hazardous. If this were being done by a private body then civil charges would inevitably result, possibly followed by criminal prosecution. I believe it is time to remove the protection of government entities from criminal prosecution.

56. JiYoung Ⓥ Chung, Bundang, Korea, Republic of
57. Marianne Good, Hudiksvall, Sweden
58. Jason Schmidt, Kansas City, Missouri
59. Matt Small, Barrie, Canada
60. Lynn Dowswell, **Orillia, Ontario, Canada**
61. K Clune, **Orillia, Canada**
62. Shimera Dione, **Orillia, Canada**
63. Joan Wall, **Orillia, Canada**
64. Richard Riley, Huntsville, Canada
65. Corin Payee, Orillia, Canada
66. Kristine Caetano, Barrie, Canada
67. Tammy Gouweloos, Barrie, Canada
68. Richard Hudon, Ottawa, Canada

- Using hydrofluorosilicic acid for fluoridation is an immoral, unethical and criminal act because it is not approved, not regulated, not treated and not tested for use in human consumption: it also contains cancer causing and neurotoxic substances in its final solution as delivered to water treatment plants.

The practice should end until valid, independently done animal studies (toxicology studies), and human studies (clinical trials) are done to determine safety in order to protect consumer safety and satisfy the legal requirements in Canada.

69. Karen Renaut, Ramara, Canada
70. Cathy Campbell, **Orillia, Canada**
71. Adam Maxwell, Sarnia, Canada
72. Stefano Serpico, Rimini, Italy (2)
73. Dr. Robert C Dickson, Calgary, Canada
74. Andrea Schweitzer, Guelph, Canada
75. Janet LoSole, **Orillia, Canada**
76. Stephanie Begin, **Orillia, Canada**
77. Dianne Orton, **Orillia, Canada**
78. Susan Schweitzer, **Orillia, Ontario, Canada**
79. Coreen Evans, Red Deer, Ab, Canada

- Everyone has the right to Hydrofluorosilicic Acid free water to drink, cook and bathe in. Its toxic waste that is being forced on us by Governments, Pharmacuticals and the Dental community when it really has nothing to do with teeth at all. It just another way to dump toxic waste! Get a tooth brush, tooth paste and floss and look after your own teeth, its not my problem if you don't and certainly not the governments!!!

80. Shawna Speerin, **Orillia, Canada**
    - I have done some research on the fluoridation of water. I did not find any benefits to fluoridating Orillia's water only negative outcomes. There are many negative outcomes to the fluoridation such as risk of osteosarcoma, premature aging and many other negative side effects. It would be a disgrace and horribly shameful if Orillias water was fluoridated putting everyone at risk.

81. Alice den Otter, **Orillia, Canada**
    - Simcoe County data shows that tooth decay was in steady decline in our region from 1979 to 2000 without water fluoridation. Tooth decay rose when the economy crashed around 2001 and lower-income families could no longer afford nutritional food and dental care. Fluoridating the water is not the answer; indeed it will negatively affect the health of at-risk populations. Instead, redirect the water fluoridation budget to help fight the real problem: poverty.

82. Sean Smith, Nobel, Canada
83. Cody Caetano, **Orillia, Canada**
84. Denise O'Connor, Novar, Canada
    - I can't even drive water at work because of the Floride in the water ! I must take my own in because I do not wish to injest Sodium Floride and put my health at risk !!!

85. Angie Sumner, **Orillia, Canada**
    - Floride is a poisin...I don't want to injest it.

86. Arne Hansen, Ramara, Canada
    -flouride is also rat poison, think about

87. John Brown, **Orillia, Canada**
88. Richard Bednar, Gravenhurst, Canada
    - It is a Human Right that I have freedom of choice whether to be medicated or not! Politics should stay out of my right to have pure water!

89. Elizabeth O'Halloran, Kettering, United Kingdom
90. Gerry Cooper, Toronto, Canada
91. Denise Reiber, **Orillia, Canada**
92. Brian McLean, Barrie, Canada
93. Victoria Pitchford, Toronto, Canada
94. Coreen Wagg, Huntsville, Canada
95. Mary C Murray, Guelph On, Canada
    - I belive fluoride is harmful, especially to young children.

96. Robert Ortiz, Phoenix, Arizona
97. Kim Riley, Huntsville, Canada
    - I'm signing because it is wrong to fluoridate water. I have not given my consent to any party to medicate me! Add that fluoride is poison makes it more criminal in my eyes.

98. David Tripp, **Orillia, Canada**
99. Misha Gilbert, **Orillia, Canada**
100. Eleanor Gail Manning, Toronto, Canada
101. Bill Osmunson, Wilsonville, Oregon
    - Freedom to choose. Fluoride is easy to get from other sourcs. Many are ingesting too much fluoride which is causing serious harm. Fluoridated water no longer provides a benefit

102. Cindy Mayor, Waterdown, Canada

103. Adrienne Larocque, Santa Rosa, California
    - I grew up with fluoridated water, but I have a mouth full of fillings. My kids grew up in Asia and drank fluoride-free water. They aren't great about brushing their teeth, and yet, not a single cavity! Proper diet has more effect on dental health than any perceived benefits of fluoridation.

104. Jenn Lorette, Kitchener, Canada
105. Sarah Rogers, London, Canada
106. Ayesha Drouillard, Windsor, Canada
107. Amanda Brown, Calgary, Canada
108. Bill Albrecht, Ottawa, Canada
109. Lloyd Stringer, **Orillia, Canada** (2)
110. Linda Querel, Ottawa, Canada
111. Grant Gordon, London, Canada
112. Chris Gupta, London, Canada
    - In addition to damaging our health the addition of industrial wastes to potable water is violating several laws. See: http://tinyurl.com/2b3udux for more details

113. Muoi Van, London, Canada
114. Margaret Rigsby, Hazel Green, Alabama (2)
115. bonnie moffat , wolcott, Connecticut

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Friday, March 16, 2012 2:24 AM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden; JASON COVEY
Subject: Susan Schweitzer Re: Fluoridation of Orillia's Water Supply

Mayor Orsi, Orillia City Councillors, and Public Works:

1) This video is excerpts from the meeting at which Tecumseh, Ontario voted to cease water fluoridation - March 13, 2012.
Please, watch it all the way through to note why council voted to stop fluoridation.

2) This video is Dr. Bill Osmunson talking to Dr. Mercola. He does an excellent job of explaining a number of reasons why water fluoridation is not a good idea. (He is considered to be an expert on the topic.) Please, watch this all the way through, also. I spoke with Dr. Osmunson for a couple of hours on Tuesday night. He has agreed to make himself available to Orillia City Council and Public Works, as a resource on fluoride. Please, contact him, and ask him as many questions as you can think to ask, on this topic. He is a dentist, and he has a master's degree in public health. Phone: 425.466.0100 Cell: 425.466.0100 - He is on Pacific Time. Email: <bill@teachingsmiles.com>
Instead of his whole CV, which is quite lengthy, I asked him to give you some background on himself:
I have been a practicing dentist for 35 years, and I have a master's degree in public health with majors in nutrition and health education. I currently coach dentists including my two sons-in-law, who are dentists and practice dentistry in both fluoridated and non-fluoridated communities, Lake Oswego and Beaverton OR, and Bellevue, WA. I also provide dental continuing education to dentists and expert testimony to cities such as Fairbanks, Sandpoint ID, Seattle WA, states, water districts, HHS, CDC, FDA, and EPA on dental topics including toxicology of dental materials such as fluoride and mercury. For the first 25 years as a dentist, I promoted fluoridation of public water, and over the last 10 years, based on scientific evidence and over 10,000 hours of study, I have become opposed to fluoridation until adequate research and legal oversight is completed. Of immediate concern is the lack of oversight (FDA CDER approval), scientists do not know how much fluoride is required to prevent caries for the teeth, many are ingesting too much fluoride for safety, and the ethics of fluoridation without individual consent is unacceptable.

Thank you. Susan Schweitzer 705-329-4908

1) Tecumseh Ontario Votes to Cease Water Fluoridation March 13, 2012
http://www.youtube.com/watch?v=cfq8TI-1MJg

2)The Toxic Import From China Hidden In This Everyday Beverage . . .
http://articles.mercola.com/sites/articles/archive/2011/10/11/dr-bill-osmunson-on-fluoride.aspx

Jason, please, add the content of this email to the Orillia water fluoridation process submissions. Thank you. Susan Schweitzer

---

325 Peter St N
Orillia, ON L3V 5A4

March 17, 2012

City of Orillia
50 Andrew St S, Suite 300,
Orillia, ON L3C 7T5

Email'd to: jcovey@orillia.ca

Attention: Jason Covey, Water/Wastewater Engineer

Hello Jason,

Re: Community Waste Fluoridation

Thank you for the opportunity to provide my comments regarding community water fluoridation, for the public record.

First, I would like to encourage the City of Orillia to hold a fair and open debate with experts on both side of this controversial issue to allow everyone an opportunity to become more informed.

All of my concerns regarding water fluoridation will not be addressed in this submission, but the few points being presented are enough, in my opinion, to vote against adding fluoride to our water supply. The business of adding fluoride to our drinking water makes no financial sense and is not worth the risk to human health and the environment.

Adding fluoride to our drinking water offers a poor return on our investment. Since less than 1% of our water is used for drinking water, over 99% of the product is wasted on watering lawns, washing cars, hosing down driveways, flushing down sinks and toilets, etc. Therefore, the idea of spending approximately $100,000, plus $25,000 every year after, to fluoridate our water to remedy to tooth decay, simply makes no financial sense.

It also does not effectively target the problem population, be it young or any other age group, because there is simply no way of ensuring that these people even drink Orillia water. Therefore, there is no guarantee that the target population, those with poor dental health, will be reached.

If the health unit were serious about improving dental health it would provide safe, affordable and more effective steps to target the problem, such as: community dental hygienists to provide free cleaning and education on proper brushing; public health nurses to teach about proper eating habits; free toothbrushes and toothpaste to those in need.

If the Health Unit was really serious about targeting the problem it might even take on the fast food outlets to end the sale of cheap pop, which might help to address the problem of tooth decay, as well as diabetes, and obesity in our community.

Millions of dollars are spent every year to determine the cause of cancer, kidney-failure, MS, Altzhymers, Osteoporosis - the list goes on and on. We simply do not know what causes these diseases, but we do know that people have ingested fluoride since the 50's. What studies have been done to determine individual response to

fluoridated water? I'm not saying that fluoride IS the cause of any one or all of these diseases, but the fact is we simply don't know, there are too many variables.

We do know that fluorosilicic acid is a toxic chemical and an industrial waste product. We also know that toxic waste is not good for us!

The City of Orillia has gone to great effort and expense to improve the quality of water that it delivers to its citizens. Significant effort by the provincial government has also been made to protect Lake Simcoe and its aquatic life. We need to reduce the chemicals entering our water supply, not add more!

This risk of adding fluoride to our water is unacceptable.
Mass medicating the entire population of Orillia is unacceptable.
Alternative strategies to reduce tooth decay are **available** and **affordable** and **more effective** in terms of targeting people that require dental health care.

It is my hope that Orillia City Council will encourage the Health Unit to choose safer alternatives to combat tooth decay. After all, **NO RISK ACCEPTABLE WHEN IT IS AVOIDABLE AND ALTERNATIVES ARE AVAILABLE!**

Thank you,

Kelly Clune

Encl. Please find following recent articles that may be helpful in your considerations.

City to pay for chemical spill, fish kill
Sunday, February 26, 2012
By MICKEY POWELL - Bulletin Staff Writer

Martinsville owes the state almost $16,450 in penalties due to a **chemical spill** into Jones Creek last fall that **resulted in thousands of dead fish**.

When it meets at 7:30 p.m. Tuesday, Martinsville City Council will consider authorizing Interim City Manager Leon Towarnicki to make the payment and sign a related consent order.
The city must pay a $13,500 fine to the State Water Control Board. It also must reimburse the Virginia Department of Environmental Quality $2,001.21 for costs related to its investigation and the Department of Game and Inland Fisheries $948.50 for replacing an estimated 4,445 fish, the order shows.
State officials arrived at the estimate using methodology of the American Fisheries Society, the order indicates.
The city negotiated a 30 percent reduction in the amount that the DEQ originally sought, according to City Attorney Eric Monday.
The consent order shows that on Oct. 18, state officials noticed a fish kill beginning at a storm drain outfall at the city's water treatment plant and extending 2.3 miles to the confluence of Jones and Beaver creeks.
The fish kill coincided with a release two days earlier of fluorosilicic acid — also known as fluoride — which entered Jones Creek from the storm drain at the treatment plant, according to the order. It shows the release stemmed from the failure of a transfer pump and a valve inadvertently being left open.

Fluoride, a chemical version of the element fluorine, is used in many public water supplies to help prevent tooth decay. The water control board determined that the acid spill caused the fish kill and the city violated state code, the consent order shows.
Interim City Manager Leon Towarnicki said Saturday he did not have information at home on what types of fish were involved, but he said they were small and likely were washed out to the Smith River.
The city is taking steps to make sure such a spill does not occur again, the order indicates. Those measures have not been disclosed.

An Industrial Solution

Fluoride is generated by aluminum, steel, fertilizer factories, coal burning power plants and in the production of glass and cement. Gaseous fluoride and other process waste byproducts have previously been allowed to be expelled through the factory smokestack New environmental regulation now require "scrubbers" atop of smokestacks to remove these toxic chemicals from escaping in the air.

In the past, little attention was paid to the emission of gaseous fluorine compounds in the fertilizer industry. But today fluorine recovery is increasingly necessary because of stringent environmental restrictions which demand drastic reductions in the quantities of volatile and toxic fluorine compounds emitted in the waste gases. These compounds now have to be recovered and converted into harmless by-products for disposal or, more desirably, into **marketable products**."
-Fluorine Recovery in the Fertilizer Industry, by H. Denzinger, H. Konig & G. Kruger, Phosphorus & Posassium Magazine, Sept/Oct 1979

These industries would have to pay dearly to dispose of their fluoride if they could not sell it to municipalities for adding to tap water.

"In other words," says William Hirzy, a Senior EPA scientist, "fluoride that otherwise would be an air and water pollutant is no longer a pollutant as long as it's poured into your reservoir. The solution to pollution is dilution and in this case, the dilution is your drinking water."

In 1983 Rebecca Hammer, the Deputy Assistant administrator in EPA's Office of Drinking Water, called fluoridation "an ideal environmental solution to a long standing problem."

Cargill fertilizer plant at Hillsborough Bay Florida (July 22,1991)

A fertilizer plant where fluorosilicic acid is a most toxic waste by-product produced from the manufacture of phosphate fertilizers.

The fluoride compounds used for water fluoridation are trapped by "scrubbers" in the smokestack of factories like the one pictured above.
http://www.nofluoride.com/Intro_Background.cfm

(from Developmental Delay Resources- dhttp://devdelay.org/newsletter/articles/html/347-fluoride-deception.html)

"What Is Fluoride?

Most fluoride is found in hydrofluoric acid, a compound of the element fluorine. It is a chemical by-product of aluminum, steel, cement, phosphate, and nuclear weapons manufacturing. This fluoride is manmade and has no nutritional value. Hydrofluoric acid is used to refine high-octane gasoline, to make fluorocarbons and chlorofluorocarbons for freezers and air conditioners, and to manufacture computer screens, fluorescent light bulbs, semiconductors, plastics, herbicides, and toothpaste."

Worldwide Expert Says,
"You Need To Know About The Dangers Of Fluoride."

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Monday, March 19, 2012 10:35 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; mforgarty@bell.blackberry.net; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; charles.gardner@smdhu.org; bill.mindell@smdhu.org
Subject: RE: You do not have my consent to put fluoride in Orillia water - WHY CAUSE CANCER?

I request that this e-mail be entered into the public record for the fluoridation issue.

The reference for the statistics quoted below is "www.worldwithoutcancer.org.uk" and go down the LHS of the home page to "Fluoridation-Linked Cancer"

FLUORIDATION-LINKED CANCER

Studies based upon the U.S. Vital Statistics for fluoridated versus non-fluoridated U.S. cities indicate a significant (greater than 99% confidence level) increase in cancer death rates occurring within the first two years of artificial fluoridation. The nine organ sites affected and their increase above the normal are:

Mouth, 15%; Oesophagus, 48%; Stomach, 22%; Large Intestine, 31%; Rectum, 51%; Kidney, 10%; Bladder and other urinary organs 22%; other organs specifically female: Breast 15%; Ovary and Fallopian Tube, 15%.

The references for this data are given in the "references" section of the report.

Can we only imagine what happens 5 years or 10 years into this UNREASONABLE practice!

Our health care costs are way to high now - would you not agree?

Why would we do this to the citizens of Orillia - DO WE REALLY NEED ANY MORE SICK PEOPLE IN THIS TOWN?

I beg you, please vote "NO" to fluoridation.

PLEASE - WILL THOSE ON DISTRIBUTION START TO DO YOUR HOMEWORK ON THIS SUBJECT! There is a HUGE body of scientific EVIDENCE that fluoridation is a really bad idea!

Also, look at the data between Montreal (non fluoridated) and the GTA! The difference is huge!

Steve Goulter

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Monday, March 19, 2012 10:50 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; mforgarty@bell.blackberry.net; Paul Spears; Pete Bowen;

Tony Madden; Peter Dance; charles.gardner@smdhu.org; bill.mindell@smdhu.org
Subject: RE: See list of communities - all rejected fluoridation - why?

Please would those on distribution phone some of the communities on this list and understand WHY they have recently rejected water fluoridation?
AND THEN REPORT YOUR FINDINGS BACK TO THE CITIZENS OF ORILLIA.

As a group of "officials" entrusted with making ethical choices, this is not only a common courtesy, BUT IT IS **YOUR DUTY!**

Steve Goulter

WHY HAVE THESE CITIES/COMMUNITIES REJECTED FLUORIDATION?

Canadian communities that have rejected or ceased fluoridation in the last twenty years are listed below:

Campbell River, British Columbia (April 1993, after 33 years of fluoridation)
Port Hardy, British Columbia (November 1993, after 19 years of fluoridation)
Kelowna, British Columbia (November 1996, after 42 years of fluoridation)
Kitmat, British Columbia (March 1998)
Whitehorse, Yukon Territory (July 1998, after 30 years of fluoridation)
Meadow Lake, Saskatchewan (July 2011)
Kamloops, British Columbia (October 2001)
Cobalt, Ontario (December 2001)
Dutton-Dunwich, Ontario (June 2003)
Comox/Courtenay, British Columbia (February 1992)
West Elgin, Ontario (June 2003)
Dieppe, New Brunswick (December 2011)
Burns Lake, British Columbia (June 2003)
Golden, British Columbia (November 2005)
Welland, Pelham, and Thorold, Ontario (February 2008)
Dryden, Ontario (April 2008)
Quebec City, Quebec (April 2008, after 36 years of fluoridation)
Drayton Valley, Alberta (December 2008)
Cranberry Portage, Manitoba (January 2009)
Squamish, British Columbia (November 1993, after 20 years of fluoridation)
Gatineau, Québec (May 2010)
Waterloo, St. Jacobs and Elmira, Ontario (October 2010)
Calgary, Alberta (February 2011)
Taber, Alberta (July 2011)
Slave Lake, Alberta (September 2011)
Churchill, Manitoba (October 2011)
Lake Cowichan, British Columbia (November 2011)
Williams Lake, British Columbia (November 2011)
Moncton, New Brunswick (December 2011)
Amherstburg, Ontario (February 2012)

… 13 of these have been in the last year

… and Windsor, Ontario – just last week – Feb 29/12 to be exact!!!!

In the United States alone, there is a similar list of over 250 communities that have rejected fluoridation in the last 20 years.

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Monday, March 19, 2012 11:22 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; charles.gardner@smdhu.org; bill.mindell@smdhu.org; Michael Fogarty
Subject: People in Orillia with chemical sensitivities

I request that this e-mail be entered into the public record for the water fluoridation issue.

In the past six weeks I have spoken to approximately 150 people about your pending plan to put Hexafluorosilicic Acid in the city water.
So far I have encountered 7 people that claim they are very sensitive to most new chemicals they encounter, and are very concerned that this may cause untold reactions.
4 of the 7 already know for sure that they WILL react to fluoride and 3 of this 4 stated categorically that they recently relocated to Orillia BECAUSE we do not fluoridate the water. These 3 said that they would have to relocate again if water fluoridation went in.

If we said that 4 out of 150 represents 2.7% of the population, then out of 30,000 people, this would mean that there are potentially **810** people WHO ALREADY KNOW THEY ARE OVERLY SENSITIVE TO FLUORIDE!

Would those on distribution please get out there and do your own statistics on this subject - don't believe my numbers. I too was blown away that this is the case.

If there is even half this many people directly affected, this fact should be taken into account. THINK ABOUT THE TAXES THESE PEOPLE PAY THE TOWN and if they move away the town will have something between $1,000,000 and $2,000,000 less taxes per year!

This would make the true cost of water fluoridation VERY EXPENSIVE for Orillia!
Steve Goulter

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Tuesday, March 20, 2012 11:49 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; charles.gardner@smdhu.org; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Subject: FW: Quotes from Maude Barlows talk at Georgian College March 7/12

Maude Barlow spoke at the Council of Canadians meeting at Georgian College on Mar 7 about the state of our world environment and, in particular, summarized the state of the worlds fresh water supply and how it is rapidly being polluted and depleted. Please would everyone on dist'n watch the whole talk at http://www.youtube.com/watch?v=8OQM2MHfX9E&list=UUq2QXWZjg-IOjUmO--dvbug&index=1&feature=plcp.

I summarize a few points that are relevant to the fluoridation issue here in Orillia:
- we live in a myth of abundance here in Ontario (especially about water)
- some say Ontario has 20% of the WORLDS fresh water!
- this is NOT true - if used/polluted, we would become a desert
- we in fact DO have 6.5 to 7% of "sustainable" worlds fresh water - this is a huge share and we are very fortunate indeed compared to most places in the world.
- our waters are therefore a very precious "GIFT", and must not be polluted.
- our "water act" is old and in urgent need of update - it does not contain relevant or appropriate guidelines for our modern "greedy/disrespectful of the Environment" times
- however, a recent "clean water act" empowers/encourages local areas to take charge of our water and protect it in any way possible. We must uphold this responsibility by seeing to it that no-one is allowed to abuse this.

In summary, I would like to relay a portion of a quote that was read as part of her introduction:
"Do NOT listen to those who say there is nothing you can do about the very large and real issues of

our times.....
..... we must commit to leaving the earth in AT LEAST as whole a condition as we inherited it"

And another quote ...."there is no future in an economy based on greed, as ours is today"

I should not have to point out what this has to do with FLUORIDATION of our water here in Orillia, BUT, I feel compelled to do so anyway;
- surely ANY human being, based on what has just been said above, could not, in all conscience, agree that dumping 70 forty-five gallon drums of level 4 toxin - Hexafluorosilicic Acid - into our precious water every year is in any way in keeping with the basic principals of "DO NO HARM".
- this toxic waste from the fertilizer industry cannot be disposed of in any other way, and has TRADITIONALLY been disposed of by putting it in city water across North America for 40 to 60 years.
- this toxic waste also contains some undefined levels of ARSENIC, LEAD AND MERCURY which can vary from very little to huge amounts, depending on the batch. All are "acceptable"!
- people are waking up - this practice will no longer be tolerated - big industry, governments at all levels, doctors, dentists, public health officials AND Health Canada are trying to defend this practice BASED ON VERY POOR QUALITY DATA..
- can the people promoting fluoridation not see that defending this position is SERIOUSLY eroding your respect, authority and credibility on MANY other topics - such as vaccinations, dental amalgams, GMO foods, artificial sweeteners, etc, all of which you equally defend?
- why have more than 30 other communities ABANDONED this totally outdated concept in recent years in Canada, and more than 250 in the USA? Big industry is desperate - they need new places to dispose of their toxic waste!
- in speaking to literally hundreds of people in Orillia over the past 3 weeks, I would like to summarize (only some) of my findings;
  - I have encountered 3 people who (before I talked to them), believed that fluoride was a good thing
  - Two readily reversed their opinion after only a brief discussion of the facts. Only one remained entrenched - and this is OK, everyone is entitled to their opinions.
  - a huge surprise to me - the vast majority are not only against fluoridation, but also VERY against the established "authority figures" - they simply do dot believe any of you on ANY subject! This is SERIOUS! You have to reverse this trend or you will have no control at all.
  - almost without exception, people quickly ask "Is there money involved? Who is getting paid? Who is benefiting?" I asked myself this question about a month ago when I first got involved - but I quickly dismissed it as not possible - surely, we have not gone that low!

To the "authority figures" out there, I say to you, "THESE ARE SERIOUS ISSUES" and they all need to be addressed ASAP! But in particular, dumping this huge amount of toxic waste needlessly into our lake IS NOT LOGICAL OR REASONABLE!

To other concerned individuals and Organizations, PLEASE HELP STOP FLUORIDATION by writing e-mails and letters to council and Health Care providers BEFORE THE DEADLINE FOR INPUT MARCH 30/12!

With full respect and confidence that you will do the right thing and vote "NO" to fluoridation, I remain,
Respectfully yours,
Steve Goulter

-----Original Message-----
From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Wednesday, March 21, 2012 3:30 AM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden

Cc: JASON COVEY
Subject: Susan Schweitzer - Information For Consideration RE: Process Regarding Orillia Water Fluoridation

Mayor Orsi and City Councillors, please, consider the attached documents, in your deliberations regarding fluoridation of Orillia's water supply, as well these websites, in their entirety:
International Society For Fluoride Research, Inc. - www.fluorideresearch.org Fluoride Action Network - www.fluoridealert.org COF-COF - www.cof-cof.ca Waterloo Watch - www.waterloowatch.com Fluoride Free Winnipeg - www.fluoridefreewinnipeg.com No Fluoride - www.nofluoride.com Moms Against Fluoridation - www.momsagainstfluoridation.org Fluoride Australia - www.fluorideaustralia.org UK Against Fluoridation - www.ukagainstfluoride.blogspot.ca Australian Action to End Water Fluoridation - www.australianfluorideaction.com Fluoride Action Network New Zealand - www.fannz.org.nz FluorideandFluorosis.com - www.fluorideandfluorosis.com
Thank you. Susan Schweitzer Jason, please, include the attachments and the websites in the process regarding Orillia water fluoridation. Thank you.

-----Original Message-----
From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Wednesday, March 21, 2012 3:30 AM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden
Cc: JASON COVEY
Subject: Susan Schweitzer - Information For Consideration RE: Process Regarding Orillia Water Fluoridation

Mayor Orsi and City Councillors, please, consider the attached documents, in your deliberations regarding fluoridation of Orillia's water supply, as well these websites, in their entirety: International Society For Fluoride Research, Inc. - www.fluorideresearch.org Fluoride Action Network - www.fluoridealert.org COF-COF - www.cof-cof.ca Waterloo Watch - www.waterloowatch.com Fluoride Free Winnipeg - www.fluoridefreewinnipeg.com No Fluoride - www.nofluoride.com Moms Against Fluoridation - www.momsagainstfluoridation.org Fluoride Australia - www.fluorideaustralia.org UK Against Fluoridation - www.ukagainstfluoride.blogspot.ca Australian Action to End Water Fluoridation - www.australianfluorideaction.com Fluoride Action Network New Zealand - www.fannz.org.nz FluorideandFluorosis.com - www.fluorideandfluorosis.com Thank you. Susan Schweitzer Jason, please, include the attachments and the websites in the process regarding Orillia water fluoridation. Thank you.

50 Reasons to Oppose Fluoridation

Updated August, 2011

By Paul Connett, PhD and other members of the Fluoride Action Network (including James Beck, MD, PhD, Michael Connett, JD, Hardy Limeback, DDS, PhD, David McRae and Spedding Micklem, D.Phil.)

Introduction

Fluoridation is the practice of adding a fluoride compound to the public drinking water supply ostensibly for the purpose of fighting tooth decay. The levels used range from 0.6 to 1.2 milligrams of fluoride ion per liter (or parts per million, ppm). The practice began in the U.S. in 1945 and was endorsed by the U.S. Public Health Service (PHS) in 1950. Very few countries have adopted this practice to any significant extent. Only eight countries in the world have more than 50% of their populations drinking artificially fluoridated water (Australia, Colombia, Ireland, Israel, Malaysia, New Zealand, Singapore, and the U.S.). In Europe, only Ireland (with 73% of the population fluoridated), the U.K. (10%) and Spain (10%) fluoridate some of their water supplies. In the U.S., about 70% of the population is drinking fluoridated water – that is approximately 200 million people and about half the number of people drinking artificially fluoridated water worldwide. Some countries have areas with high natural fluoride levels in the water. These include India, China and parts of Africa. In these countries measures are being taken to remove the fluoride because of the health problems that fluoride can cause.

Fluoridation is a bad medical practice

1. **Fluoride is the only chemical added to water for the purpose of medical treatment**. The U.S. Food and Drug Administration (FDA) classifies fluoride as a drug when used to prevent or mitigate disease (FDA 2000). As a matter of basic logic, adding fluoride to water for the sole purpose of preventing tooth decay (a non-waterborne disease) is a form of medical treatment. All other water treatment chemicals are added to improve the water's quality or safety, which fluoride does not do.
2. **Fluoridation is unethical**. Informed consent is standard practice for all medication, and one of the key reasons why most of Western Europe has ruled against fluoridation. With water fluoridation we are allowing governments to do to whole communities (forcing people to take a medicine irrespective of their consent) what individual doctors cannot do to individual patients. While referenda are preferential to imposed policies from government, it still leaves the problem of individual rights versus majority rule. Put another way: Does a voter have the right to require that their neighbor ingest a certain medication (even if it is against that neighbor's will)?

3. **The dose cannot be controlled**. Once fluoride is put in the water it is impossible to control the dose each individual receives because people drink different amounts of water. Being able to control the dose a patient receives is critical. Some people (e.g., manual laborers, athletes, diabetics, and people with kidney disease) drink substantially more water than others.
4. **The fluoride goes to everyone regardless of age, health or vulnerability.** According to Dr. Arvid Carlsson, the 2000 Nobel Laureate in Medicine and Physiology and one of the scientists who helped keep fluoridation out of Sweden:

> "Water fluoridation goes against leading principles of pharmacotherapy, which is progressing from a stereotyped medication -- of the type 1 tablet 3 times a day -- to a much more individualized therapy as regards both dosage and selection of drugs. The addition of drugs to the drinking water means exactly the opposite of an individualized therapy" (Carlsson 1978).

5. **People now receive fluoride from many other sources besides water.** Fluoridated water is not the only way people are exposed to fluoride. Other sources of fluoride include food and beverages processed with fluoridated water (Kiritsy 1996; Heilman 1999), fluoridated dental products (Bentley 1999; Levy 1999), mechanically deboned meat (Fein 2001), tea (Levy 1999), and pesticide residues (e.g., from cryolite) on food (Stannard 1991; Burgstahler 1997). It is now widely acknowledged that exposure to non-water sources of fluoride has significantly increased since the water fluoridation program first began (NRC 2006).
6. **Fluoride is not an essential nutrient** (National Research Council [NRC] 1993; Institute of Medicine [IOM] 1997, NRC 2006). No disease has ever been linked to a fluoride deficiency. It has never been shown that ingested fluoride is needed to produce decay-free teeth. Not a single biological process has been shown to require fluoride. On the contrary there is extensive evidence that fluoride can interfere with many important biological processes. Fluoride interferes with numerous enzymes (Waldbott 1978). In combination with aluminum, fluoride interferes with G-proteins (Bigay 1985, 1987). Such interactions give aluminum-fluoride complexes the potential to interfere with signals from growth factors, hormones and neurotransmitters (Strunecka & Patocka 1999; Li 2003). More and more studies are indicating that fluoride can interfere with biochemistry in fundamental ways (Barbier 2010).
7. **The level in mothers' milk is very low**. Considering reason #6 it is perhaps not surprising that the level of fluoride in mother's milk is remarkably low (0.004 ppm, NRC, 2006). This means that a bottle-fed baby consuming fluoridated water (0.6 – 1.2 ppm) can get up to 300 times more fluoride than a breast-fed baby. There are no benefits (see reasons #11-19), only risks (see reasons #21-36), for infants

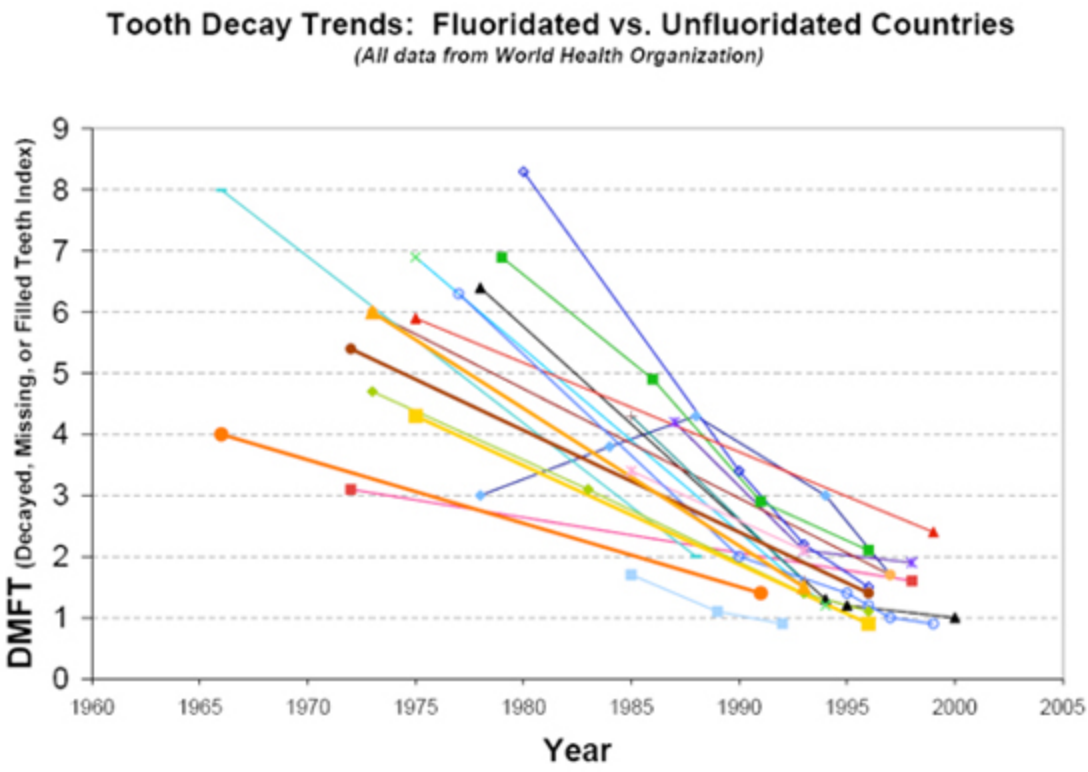
ingesting this heightened level of fluoride at such an early age (an age where susceptibility to environmental toxins is particularly high).

8. **Fluoride accumulates in the body**. Healthy adult kidneys excrete 50 to 60% of the fluoride they ingest each day (Marier & Rose 1971). The remainder accumulates in the body, largely in calcifying tissues such as the bones and pineal gland (Luke 1997, 2001). Infants and children excrete less fluoride from their kidneys and take up to 80% of ingested fluoride into their bones (Ekstrand 1994). The fluoride concentration in bone steadily increases over a lifetime (NRC 2006).
9. **No health agency in fluoridated countries is monitoring fluoride exposure or side effects**. No regular measurements are being made of the levels of fluoride in urine, blood, bones, hair, or nails of either the general population or sensitive subparts of the population (e.g., individuals with kidney disease).
10. **There has never been a single randomized clinical trial to demonstrate fluoridation's effectiveness or safety**. Despite the fact that fluoride has been added to community water supplies for over 60 years, "there have been no randomized trials of water fluoridation" (Cheng 2007). Randomized studies are the standard method for determining the safety and effectiveness of any purportedly beneficial medical treatment. In 2000, the British Government's "York Review" could not give a single fluoridation trial a Grade A classification – despite 50 years of research (McDonagh 2000). The U.S. Food and Drug Administration (FDA) continues to classify fluoride as an "unapproved new drug."

Swallowing fluoride provides no (or very little) benefit

11. **Benefit is topical not systemic.** The Centers for Disease Control and Prevention (CDC, 1999, 2001) has now acknowledged that the mechanism of fluoride's benefits are mainly topical, not systemic. There is no need whatsoever, therefore, to swallow fluoride to protect teeth. Since the purported benefit of fluoride is topical, and the risks are systemic, it makes more sense to deliver the fluoride directly to the tooth in the form of toothpaste. Since swallowing fluoride is unnecessary, and potentially dangerous, there is no justification for forcing people (against their will) to ingest fluoride through their water supply.
12. **Fluoridation is not necessary.** Most western, industrialized countries have rejected water fluoridation, but have nevertheless experienced the same decline in childhood dental decay as fluoridated countries. (See data from World Health Organization presented graphically in Figure 1).

Figure 1.



13. **Fluoridation's role in the decline of tooth decay is in serious doubt.** The largest survey ever conducted in the US (over 39,000 children from 84 communities) by the National Institute of Dental Research showed little difference in tooth decay among children in fluoridated and non-fluoridated communities (Hileman 1989). According to NIDR researchers, the study found an average difference of only 0.6 DMFS (Decayed, Missing, and F illed Surfaces) in the permanent teeth of children aged 5-17 residing their entire lives in either fluoridated or unfluoridated areas (Brunelle & Carlos, 1990). This difference is less than one tooth surface, and less than 1% of the 100+ tooth surfaces available in a child's mouth. Large surveys from three Australian states have found even less of a benefit, with decay reductions ranging from 0 to 0.3 of one permanent tooth surface (Spencer 1996; Armfield & Spencer 2004). None of these studies have allowed for the possible delayed eruption of the teeth that may be caused by exposure to fluoride, for which there is some evidence (Komarek 2005). A one-year delay in eruption of the permanent teeth would eliminate the very small benefit recorded in these modern studies.
14. **NIH-funded study on individual fluoride ingestion and tooth decay failed to find a significant correlation**. A multi-million dollar, U.S. National Institutes of Health (NIH) -funded study (Warren 2009) found no relation between tooth decay

and the amount of fluoride ingested by children. This is the first time that tooth decay has been investigated as a function of individual exposure as opposed to mere residence in a fluoridated community.

15. **Tooth decay is high in low-income communities that have been fluoridated for years**. Despite some claims to the contrary, water fluoridation cannot prevent the oral health crises that result from rampant poverty, inadequate nutrition, and lack of access to dental care. There have been numerous reports of severe dental crises in low-income neighborhoods of US cities that have been fluoridated for over 20 y ears (e.g., Boston, Cincinnati, New York City, and Pittsburgh). In addition, fluoridation has been repeatedly found to be ineffective at preventing the most serious oral health problem facing poor children, namely "baby bottle tooth decay," otherwise known as early childhood caries (Barnes 1992; Shiboski 2003).
16. **Tooth decay does not go up when fluoridation is stopped.** Where fluoridation has been discontinued in communities from Canada, the former East Germany, Cuba and Finland, dental decay has not increased but has generally continued to decrease (Maupomé 2001; Kunzel & Fischer, 1997, 2000; Kunzel 2000; Seppa 2000).
17. **Tooth decay was coming down before fluoridation started.** Modern research (e.g., Diesendorf 1986; Colquhoun 1997) shows that decay rates were coming down before fluoridation was introduced in Australia and New Zealand and have continued to decline even after its benefits would have been maximized (see Figure 2). Many other factors influence tooth decay.

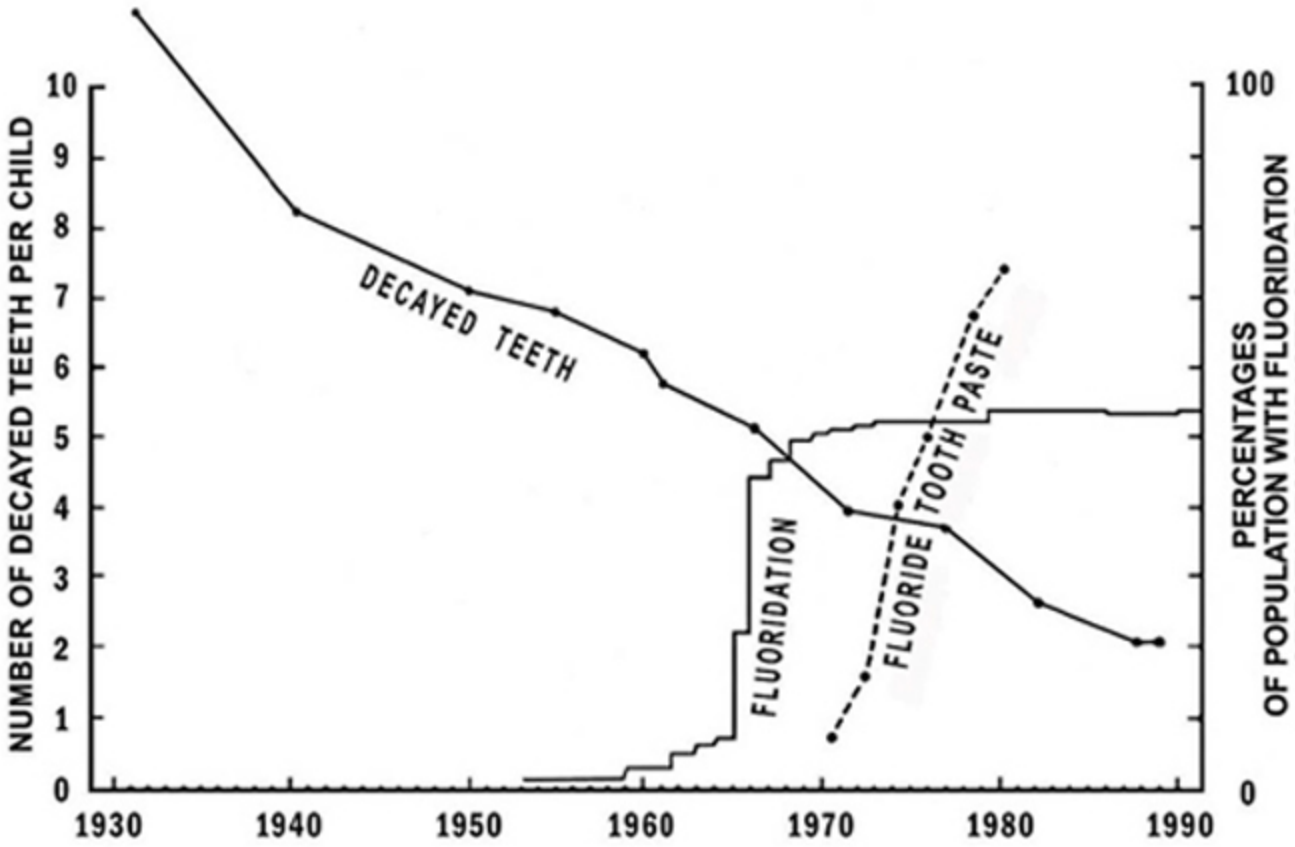


Figure 2. The number of decayed teeth in 5-year olds in New Zealand, over the period 1930-1990. The percentage of the population drinking fluoridated water and the percentage of the total toothpaste sold containing fluoride are shown on the right hand axis (Colquhoun, 1993).

18. **The studies that launched fluoridation were methodologically flawed.** The early trials conducted between 1945 and 1955 in North America that helped to launch fluoridation, have been heavily criticized for their poor methodology and poor choice of control communities (De Stefano 1954; Sutton 1959, 1960, 1996; Ziegelbecker 1970). According to Dr. Hubert Arnold, a s tatistician from the University of California at Davis, the early fluoridation trials "are especially rich in fallacies, improper design, invalid use of statistical methods, omissions of contrary data, and just plain muddleheadedness and hebetude." Serious questions have also been raised about Trendley Dean's (the father of fluoridation) famous 21-city study from 1942 (Ziegelbecker 1981).

Children are being over-exposed to fluoride

19. **Children are being over-exposed to fluoride.** The fluoridation program has massively failed to achieve one of its key objectives, i.e., to lower dental decay rates while limiting the occurrence of dental fluorosis (a discoloring of tooth enamel caused by too much fluoride. The goal of the early promoters of fluoridation was to limit dental fluorosis (in its very mild form) to 10% of children (NRC 1993, pp. 6-7). In 2010, however, the Centers for Disease Control and Prevention (CDC) reported that 41% of American adolescents had dental fluorosis, with 8.6% having mild fluorosis and 3.6% having either moderate or severe dental fluorosis (Beltran-Aguilar 2010). As the 41% prevalence figure is a national average and includes children living in fluoridated and unfluoridated areas, the fluorosis rate in fluoridated communities will obviously be higher. The British Government's York Review estimated that up to 48% of children in fluoridated areas worldwide have dental fluorosis in all forms, with 12.5% having fluorosis of aesthetic concern (McDonagh, 2000).
20. **The highest doses of fluoride are going to bottle-fed babies.** Because of their sole reliance on liquids for their food intake, infants consuming formula made with fluoridated water have the highest exposure to fluoride, by bodyweight, in the population. Because infant exposure to fluoridated water has been repeatedly found to be a major risk factor for developing dental fluorosis later in life (Marshall 2004; Hong 2006; Levy 2010), a number of dental researchers have recommended that parents of newborns not use fluoridated water when reconstituting formula (Ekstrand 1996; Pendrys 1998; Fomon 2000; Brothwell 2003; Marshall 2004). Even the American Dental Association (ADA), the most ardent institutional proponent of fluoridation, distributed a November 6, 2006 email alert to its members recommending that parents be advised that formula should be made with "low or no-fluoride water." Unfortunately, the ADA has done little to get this information into the hands of parents. As a result, many parents remain unaware of the fluorosis risk from infant exposure to fluoridated water.

Evidence of harm to other tissues

21. **Dental fluorosis may be an indicator of wider systemic damage**. There have been many suggestions as to the possible biochemical mechanisms underlying the development of dental fluorosis (Matsuo 1998; Den Besten 1999; Sharma 2008; Duan 2011; Tye 2011) and they are complicated for a lay reader. While promoters of fluoridation are content to dismiss dental fluorosis (in its milder forms) as merely a cosmetic effect, it is rash to assume that fluoride is not impacting other developing tissues when it is visibly damaging the teeth by some biochemical mechanism (Groth 1973; Colquhoun 1997). Moreover, ingested fluoride can only cause dental fluorosis during the period before the permanent teeth have erupted (6-8 years), other tissues are potentially susceptible to damage throughout life. For example, in areas of naturally high levels of fluoride

the first indicator of harm is dental fluorosis in children. In the same communities many older people develop skeletal fluorosis.

22. **Fluoride may damage the brain**. According to the National Research Council (2006), "it is apparent that fluorides have the ability to interfere with the functions of the brain." In a review of the literature commissioned by the US Environmental Protection Agency (EPA), fluoride has been listed among about 100 chemicals for which there is "substantial evidence of developmental neurotoxicity." Animal experiments show that fluoride accumulates in the brain and alters mental behavior in a manner consistent with a neurotoxic agent (Mullenix 1995). In total, there have now been over 100 animal experiments showing that fluoride can damage the brain and impact learning and behavior. According to fluoridation proponents, these animal studies can be ignored because high doses were used. However, it is important to note that it takes 5-20 times more fluoride to reach the same plasma levels in rats as reached in humans (Sawan 2010). In fact, one animal experiment found effects at remarkably low doses (Varner 1998). In this study, rats fed for one year with 1 ppm fluoride in their water (the same level used in fluoridation programs), using either sodium fluoride or aluminum fluoride, had morphological changes to their kidneys and brains, an increased uptake of aluminum in the brain, and the formation of beta-amyloid deposits which are associated with Alzheimer's disease. Other animal studies have found effects on the brain at water fluoride levels as low as 5 ppm (Liu 2010).(For a complete listing of these studies.
23. **Fluoride may lower IQ**. There have now been 24 studies from China, Iran, India and Mexico that have reported an association between fluoride exposure and reduced IQ. One of these studies (Lin Fa-Fu 1991) indicates that even just moderate levels of fluoride exposure (e.g., 0.9 ppm in the water) can exacerbate the neurological defects of iodine deficiency. In the absence of iodine deficiency, another research team (Xiang 2003a,b) estimated that fluoride may lower IQ at 1.9 ppm, while a recent preliminary study (Ding 2011) found a lowering of IQ in children drinking water at levels ranging from 0.3 to 3 ppm. The authors of this latter study reported that for each increase of 1 ppm fluoride measured in the urine there was a loss of 0.59 IQ points. None of these studies indicates an adequate margin of safety to protect all children drinking artificially fluoridated water from this affect. According to the National Research Council (2006), "the consistency of the results [in fluoride/IQ studies] appears significant enough to warrant additional research on the effects of fluoride on intelligence." Except for an early and small IQ study from New Zealand (Shannon et al., 1986) no fluoridating country has investigated the matter for themselves.
24. **Fluoride may cause non-IQ neurotoxic effects.** Reduced IQ is not the only neurotoxic effect that may result from fluoride exposure. At least three human studies have reported an association between fluoride exposure and impaired visual-spatial organization (Calderon 2000; Li 2004; Rocha-Amador 2009); while

three other studies have found an association between prenatal fluoride exposure and fetal brain damage (Han 1989; Du 1992; Yu 1996).

25. **Fluoride affects the pineal gland.** Studies by Jennifer Luke (2001) show that fluoride accumulates in the human pineal gland to very high levels. In her Ph.D. thesis, Luke has also shown in animal studies that fluoride reduces melatonin production and leads to an earlier onset of puberty (Luke 1997). Consistent with Luke's findings, one of the earliest fluoridation trials in the U.S. (Schlesinger 1956) reported that on average young girls in the fluoridated community reached menstruation 5 months earlier than girls in the non-fluoridated community. Inexplicably, no fluoridating country has attempted to reproduce either Luke's or Schlesinger's findings or examine the issue any further.
26. **Fluoride affects thyroid function.** According to the U.S. National Research Council (2006), "several lines of information indicate an effect of fluoride exposure on thyroid function." In the Ukraine, Bachinskii (1985) found a lowering of thyroid function, among otherwise healthy people, at 2.3 ppm fluoride in water. In the middle of the 20th century, fluoride was prescribed by a number of European doctors to reduce the activity of the thyroid gland for those suffering from hyperthyroidism (overactive thyroid) (Stecher 1960; Waldbott 1978). According to a clinical study by Galletti and Joyet (1958), the thyroid function of hyperthyroid patients was effectively reduced at just 2.3 to 4.5 mg/day of fluoride ion. To put this finding in perspective, the Department of Health and Human Services (DHHS, 1991) has estimated that total fluoride exposure in fluoridated communities ranges from 1.6 to 6.6 mg/day. This is a remarkable fact, particularly considering the rampant and increasing problem of hypothyroidism (underactive thyroid) in the United States and other fluoridated countries. Symptoms of hypothyroidism include depression, fatigue, weight gain, muscle and joint pains, increased cholesterol levels, and heart disease. In 2010, the second most prescribed drug of the year was Synthroid (sodium levothyroxine) which is a hormone replacement drug used to treat an underactive thyroid.
27. **Fluoride causes arthritic symptoms**. Some of the early symptoms of skeletal fluorosis (a fluoride-induced bone and joint disease that impacts millions of people in India, China, and Africa), mimic the symptoms of arthritis (Singh 1963; Franke 1975; Teotia 1976; Carnow 1981; Czerwinski 1988; DHHS 1991). According to a review on fluoridation published in Chemical & Engineering News, "Because some of the clinical symptoms mimic arthritis, the first two clinical phases of skeletal fluorosis could be easily misdiagnosed" (Hileman 1988). Few, if any, studies have been done to determine the extent of this misdiagnosis, and whether the high prevalence of arthritis in America (1 in 3 Americans have some form of arthritis - CDC, 2002) and other fluoridated countries is related to growing fluoride exposure, which is highly plausible. Even when individuals in the U.S. suffer advanced forms of skeletal fluorosis (from drinking large amounts of tea), it has taken years of misdiagnoses before doctors finally correctly diagnosed the condition as fluorosis.

28. **Fluoride damages bone**. An early fluoridation trial (Newburgh-Kingston 1945-55) found a significant two-fold increase in cortical bone defects among children in the fluoridated community (Schlesinger 1956). The cortical bone is the outside layer of the bone and is important to protect against fracture. While this result was not considered important at the time with respect to bone fractures, it did prompt questions about a possible link to osteosarcoma (Caffey, 1955; NAS, 1977). In 2001, Alarcon-Herrera and co-workers reported a linear correlation between the severity of dental fluorosis and the frequency of bone fractures in both children and adults in a high fluoride area in Mexico.
29. **Fluoride may increase hip fractures in the elderly.** When high doses of fluoride (average 26 mg per day) were used in trials to treat patients with osteoporosis in an effort to harden their bones and reduce fracture rates, it actually led to a higher number of fractures, particularly hip fractures (Inkovaara 1975; Gerster 1983; Dambacher 1986; O'Duffy 1986; Hedlund 1989; Bayley 1990; Gutteridge 1990. 2002; Orcel 1990; Riggs 1990 and Schnitzler 1990). Hip fracture is a very serious issue for the elderly, often leading to a loss of independence or a shortened life. There have been over a dozen studies published since 1990 that have investigated a possible relationship between hip fractures and long term consumption of artificially fluoridated water or water with high natural levels. The results have been mixed – some have found an association and others have not. Some have even claimed a protective effect. One very important study in China, which examined hip fractures in six Chinese villages, found what appears to be a dose-related increase in hip fracture as the concentration of fluoride rose from 1 ppm to 8 ppm (Li 2001) offering little comfort to those who drink a lot of fluoridated water. Moreover, in the only human epidemiological study to assess bone strength as a function of bone fluoride concentration, researchers from the University of Toronto found that (as with animal studies) the strength of bone declined with increasing fluoride content (Chachra 2010). Finally, a recent study from Iowa (Levy 2009), published data suggesting that low-level fluoride exposure may have a detrimental effect on cortical bone density in girls (an effect that has been repeatedly documented in clinical trials and which has been posited as an important mechanism by which fluoride may increase bone fracture rates).
30. **People with impaired kidney function are particularly vulnerable to bone damage.** Because of their inability to effectively excrete fluoride, people with kidney disease are prone to accumulating high levels of fluoride in their bone and blood. As a result of this high fluoride body burden, kidney patients have an elevated risk for developing skeletal fluorosis. In one of the few U.S. studies investigating the matter, crippling skeletal fluorosis was documented among patients with severe kidney disease drinking water with just 1.7 ppm fluoride (Johnson 1979). Since severe skeletal fluorosis in kidney patients has been detected in small case studies, it is likely that larger, systematic studies would detect skeletal fluorosis at even lower fluoride levels.

31. **Fluoride may cause bone cancer (osteosarcoma)**. A U.S. government-funded animal study found a dose-dependent increase in bone cancer (osteosarcoma) in fluoride-treated, male rats (NTP 1990). Following the results of this study, the National Cancer Institute (NCI) reviewed national cancer data in the U.S. and found a significantly higher rate of osteosarcoma (a bone cancer) in young men in fluoridated versus unfluoridated areas (Hoover et al 1991a). While the NCI concluded (based on an analysis lacking statistical power) that fluoridation was not the cause (Hoover et al 1991b), no explanation was provided to explain the higher rates in the fluoridated areas. A smaller study from New Jersey (Cohn 1992) found osteosarcoma rates to be up to 6 times higher in young men living in fluoridated versus unfluoridated areas. Other epidemiological studies of varying size and quality have failed to find this relationship (a summary of these can be found in Bassin, 2001 and Connett & Neurath, 2005). There are three reasons why a fluoride-osteosarcoma connection is plausible: First, fluoride accumulates to a high level in bone. Second, fluoride stimulates bone growth. And, third, fluoride can interfere with the genetic apparatus of bone cells in several ways; it has been shown to be mutagenic, cause chromosome damage, and interfere with the enzymes involved with DNA repair in both cell and tissue studies (Tsutsui 1984; Caspary 1987; Kishi 1993; Mihashi 1996; Zhang 2009). In addition to cell and tissue studies, a correlation between fluoride exposure and chromosome damage in humans has also been reported (Sheth 1994; Wu 1995; Meng 1997; Joseph 2000).
32. **Proponents have failed to refute the Bassin-Osteosarcoma study.** In 2001, Elise Bassin, a dentist, successfully defended her doctoral thesis at Harvard in which she found that young boys had a five-to-seven fold increased risk of getting osteosarcoma by the age of 20 if they drank fluoridated water during their mid-childhood growth spurt (age 6 to 8). The study was published in 2006 (Bassin 2006) but has been largely discounted by fluoridating countries because her thesis adviser Professor Chester Douglass (a promoter of fluoridation and a consultant for Colgate) promised a larger study that he claimed would discount her thesis (Douglass and Joshipura, 2006). Now, after 5 years of waiting the Douglass study has finally been published (Kim 2011) but in no way does this study discount Bassin's findings. The study, which used far fewer controls than Bassin's analysis, did not even attempt to assess the age-specific window of risk that Bassin identified. Indeed, by the authors' own admission, the study had no capacity to assess the risk of osteosarcoma among children and adolescents (the precise population of concern). For a critique of the Douglass study, click here.
33. **Fluoride may cause reproductive problems.** Fluoride administered to animals at high doses wreaks havoc on the male reproductive system - it damages sperm and increases the rate of infertility in a number of different species (Kour 1980; Chinoy 1989; Chinoy 1991; Susheela 1991; Chinoy 1994; Kumar 1994; Narayana 1994a,b; Zhao 1995; Elbetieha 2000; Ghosh 2002; Zakrzewska 2002).

In addition, an epidemiological study from the US found increased rates of infertility among couples living in areas with 3 ppm or more fluoride in the water (Freni 1994), two studies have found reduced level of circulating testosterone in males living in high fluoride areas (Susheela 1996; Barot 1998), and a study of fluoride-exposed workers reported a "subclinical reproductive effect" (Ortiz-Perez 2003). While animal studies by FDA researchers have failed to find evidence of reproductive toxicity in fluoride-exposed rats (Sprando 1996, 1997, 1998), the National Research Council (2006) has recommended that, "the relationship between fluoride and fertility requires additional study."

34. **Some individuals are highly sensitive to low levels of fluoride** as shown by case studies and double blind studies (Shea 1967; Waldbott 1978; Moolenburgh 1987). In one study, which lasted 13 years, Feltman and Kosel (1961) showed that about 1% of patients given 1 mg of fluoride each day developed negative reactions. Many individuals have reported suffering from symptoms such as fatigue, headaches, rashes and stomach and gastro intestinal tract problems, which disappear when they avoid fluoride in their water and diet. Frequently the symptoms reappear when they are unwittingly exposed to fluoride again (Spittle, 2008). No fluoridating government has conducted scientific studies to take this issue beyond these anecdotal reports. Without the willingness of governments to investigate these reports scientifically, should we as a society be forcing these people to ingest fluoride?
35. **Other subsets of population are more vulnerable to fluoride's toxicity.** In addition to people suffering from impaired kidney function discussed in reason #30 other subsets of the population are more vulnerable.to fluoride's toxic effects. According to the Agency for Toxic Substances and Disease Registry (ATSDR 1993) these include: infants, the elderly and diabetics. Also vulnerable are those who suffer from malnutrition (e.g., calcium, magnesium, vitamin C, vitamin D and iodine deficiencies and protein-poor diets. See: Massler & Schour 1952; Marier & Rose 1977; Lin Fa-Fu 1991; Chen 1997; Teotia 1998).

No Margin of Safety

36. **There is no margin of safety for several health effects**. No one can deny that high natural levels of fluoride damage health. Millions of people in India and China have had their health compromised by fluoride. The real argument is about whether there is an adequate margin of safety between the doses that have been shown to cause harm in published studies and the total dose people receive consuming uncontrolled amounts of fluoridated water and non-water sources of fluoride. This margin of safety has to take into account the wide range of individual sensitivity expected in a large population (a safety factor of 10 is usually applied to the lowest level causing harm). Another safety factor is also needed to take into account the wide range of doses to which people are exposed. There is clearly no margin of safety for dental fluorosis (CDC, 2010)

and based on the following studies nowhere near an adequate margin of safety for lowered IQ (Xiang 2003a,b; Ding 2011); lowered thyroid function (Galletti & Joyet 1958; Bachinskii 1985; Lin 1991); bone fractures in children (Alarcon-Herrera 2001) or hip fractures in the elderly (Kurttio 1999; Li 2001). All these harmful effects are discussed in the NRC (2006) review.

Environmental Justice

37. **Low-income families penalized by fluoridation.** Those most likely to suffer from poor nutrition, and thus more likely to be more vulnerable to fluoride's toxic effects, are the poor, who unfortunately, are the very people being targeted by new fluoridation programs. While at heightened risk, poor families are least able to afford avoiding fluoride once it is added to the water supply. No financial support is being offered to these families to help them get alternative water supplies or to help pay the costs of treating unsightly cases of dental fluorosis.
38. **Black and Hispanic children are more vulnerable to fluoride's toxicity.** According to the CDC's national survey of dental fluorosis, black and Mexican-American children have significantly higher rates of dental fluorosis than white children (Beltran-Aguilar 2005, Table 23). The recognition that minority children appear to be more vulnerable to toxic effects of fluoride, combined with the fact that low-income families are less able to avoid drinking fluoridated water, has prompted prominent leaders in the environmental-justice movement to oppose mandatory fluoridation in Georgia. In a statement issued in May 2011, the Rev. Andrew Young, a colleague of Martin Luther King, Jr., and former Mayor of Atlanta and former US Ambassador to the United Nations, stated:

> "I am most deeply concerned for poor families who have babies: if they cannot afford unfluoridated water for their babies' milk formula, do their babies not count? Of course they do. This is an issue of fairness, civil rights, and compassion. We must find better ways to prevent cavities, such as helping those most at risk for cavities obtain access to the services of a dentist…My father was a dentist. I formerly was a strong believer in the benefits of water fluoridation for preventing cavities. But many things that we began to do 50 or more years ago we now no longer do, because we have learned further information that changes our practices and policies. So it is with fluoridation."
> (see:http://www2.fluoridealert.org/Alert/United-States/Georgia/Atlanta-Civil-Rights-Leaders-Callfor- Halt-to-Water-Fluoridation)

39. **Minorities are not being warned about their vulnerabilities to fluoride.** The CDC is not warning black and Mexican-American children that they have higher

rates of dental fluorosis than Caucasian children (see #38). This extra vulnerability may extend to other toxic effects of fluoride. Black Americans have higher rates of lactose intolerance, kidney problems and diabetes, all of which may exacerbate fluoride's toxicity.

40. **Tooth decay reflects low-income not low-fluoride intake**. Since dental decay is most concentrated in poor communities, we should be spending our efforts trying to increase the access to dental care for low-income families. The highest rates of tooth decay today can be found in low-income areas that have been fluoridated for many years. The real "Oral Health Crisis" that exists today in the United States, is not a lack of fluoride but poverty and lack of dental insurance. The Surgeon General has estimated that 80% of dentists in the US do not treat children on Medicaid.

The largely untested chemicals used in fluoridation programs

41. **The chemicals used to fluoridate water are not pharmaceutical grade.** Instead, they largely come from the wet scrubbing systems of the phosphate fertilizer industry. These chemicals (90% of which are sodium fluorosilicate and fluorosilicic acid), are classified hazardous wastes contaminated with various impurities. Recent testing by the National Sanitation Foundation suggest that the levels of arsenic in these silicon fluorides are relatively high (up to 1.6 ppb after dilution into public water) and of potential concern (NSF 2000 and Wang 2000). Arsenic is a known human carcinogen for which there is no safe level. This one contaminant alone could be increasing cancer rates – and unnecessarily so.
42. **The silicon fluorides have not been tested comprehensively.** The chemical usually tested in animal studies is pharmaceutical grade sodium fluoride, not industrial grade fluorosilicic acid. Proponents claim that once the silicon fluorides have been diluted at the public water works they are completely dissociated to free fluoride ions and hydrated silica and thus there is no need to examine the toxicology of these compounds. However, while a study from the University of Michigan (Finney et al., 2006) showed complete dissociation at neutral pH, in acidic conditions (pH 3) there was a stable complex containing five fluoride ions. Thus the possibility arises that such a complex may be regenerated in the stomach where the pH lies between 1 and 2.
43. **The silicon fluorides may increase lead uptake into children's blood.** Studies by Masters and Coplan 1999, 2000, 2007 show an association between the use of fluorosilicic acid (and its sodium salt) to fluoridate water and an increased uptake of lead into children's blood. Because of lead's acknowledged ability to damage the developing brain, this is a very serious finding. Nevertheless, it is being largely ignored by fluoridating countries. This association received some strong biochemical support from an animal study by Sawan et al. (2010) who found that exposure of rats to a combination of

fluorosilicic acid and lead in their drinking water increased the uptake of lead into blood some threefold over exposure to lead alone.

44. **Fluoride may leach lead from pipes, brass fittings and soldered joints.** Maas et al (2007) have shown that fluoridating agents in combination with chlorinating agents such as chloroamine increase the leaching of lead from brass fittings used in plumbing. While proponents may argue about the neurotoxic effects of low levels of fluoride there is no argument that lead at very low levels lowers IQ in children.

Continued promotion of fluoridation is unscientific

45. **Key health studies have not been done**. In the January 2008 issue of Scientific American, Professor John Doull, the chairman of the important 2006 National Research Council review, Fluoride in Drinking Water: A Review of EPA's Standards, is quoted as saying:

> What the committee found is that we've gone with the status quo regarding fluoride for many years—for too long really—and now we need to take a fresh look . . . In the scientific community people tend to think this is settled. I mean, when the U.S. surgeon general comes out and says this is one of the top 10 greatest achievements of the 20th century, that's a hard hurdle to get over. But when we looked at the studies that have been done, we found that many of these questions are unsettled and we have much less information than we should, considering how long this [fluoridation] has been going on.

The absence of studies is being used by promoters as meaning the absence of harm. This is an irresponsible position.

46. **Endorsements do not represent scientific evidence.** Many of those promoting fluoridation rely heavily on a list of endorsements. However, the U.S. PHS first endorsed fluoridation in 1950, before one single trial had been completed and before any significant health studies had been published (see chapters 9 and 10 in *The Case Against Fluoride* for the significance of this PHS endorsement for the future promotion of fluoridation). Many other endorsements swiftly followed with little evidence of any scientific rational for doing so. The continued use of these endorsements has more to do with political science than medical science.
47. **Review panels hand-picked to deliver a pro-fluoridation result.** Every so often, particularly when their fluoridation program is under threat, governments of fluoridating countries hand-pick panels to deliver reports that provide the necessary re-endorsement of the practice.

In their recent book Fluoride Wars (2009), which is otherwise slanted toward fluoridation, Alan Freeze and Jay Lehr concede this point when they write:

> There is one anti-fluoridationist charge that does have some truth to it. Anti-fluoride forces have always claimed that the many government-sponsored review panels set up over the years to assess the costs and benefits of fluoridation were stacked in favor of fluoridation. A review of the membership of the various panels confirms this charge. The expert committees that put together reports by the American Association for the Advancement of Science in 1941, 1944 and 1954; the National Academy of Sciences in 1951, 1971, 1977 and 1993; the World Health Organization in 1958 and 1970; and the U.S. Public Health Service in 1991 are rife with the names of well-known medical and dental researchers who actively campaigned on behalf of fluoridation or whose research was held in high regard in the pro-fluoridation movement. Membership was interlocking and incestuous.

The most recent examples of these self-fulfilling prophecies have come from the Irish Fluoridation Forum (2002); the National Health and Medical Research Council (NHMRC, 2007) and Health Canada (2008, 2010). The latter used a panel of six experts to review the health literature. Four of the six were pro-fluoridation dentists and the other two had no demonstrated expertise on fluoride. A notable exception to this trend was the appointment by the U.S. National Research Council of the first balanced panel of experts ever selected to look at fluoride's toxicity in the U.S. This panel of twelve reviewed the US EPA's safe drinking water standards for fluoride. After three and half years the panel concluded in a 507- page report that the safe drinking water standard was not protective of health and a new maximum contaminant level goal (MCLG) should be determined (NRC, 2006). If normal toxicological procedures and appropriate margins of safety were applied to their findings this report should spell an end to water fluoridation. Unfortunately in January of 2011 the US EPA Office of Water made it clear that they would not determine a value for the MCLG that would jeopardize the water fluoridation program (EPA press release, Jan 7, 2011. Once again politics was allowed to trump science.

More and more independent scientists oppose fluoridation

48. **Many scientists oppose fluoridation.** Proponents of fluoridation have maintained for many years— despite the fact that the earliest opponents of fluoridation were biochemists—that the only people opposed to fluoridation are not bona fide scientists. Today, as more and more scientists, doctors, dentists and other professionals, read the primary literature for themselves, rather than

relying on self-serving statements from the ADA and the CDC, they are realizing that they and the general public have not been diligently informed by their professional bodies on this subject. As of July 2011, over 3700 professionals have signed a statement calling for an end to water fluoridation worldwide. This statement and a list of signatories can be found on the website of the Fluoride Action Network (see: www.FluorideAlert.org). A glimpse of the caliber of those opposing fluoridation can be gleaned by watching the 28-minute video "Professional Perspectives on Water fluoridation" which can be viewed online at the same FAN site.

Proponents' dubious tactics

49. **Proponents usually refuse to defend fluoridation in open debate.** While pro-fluoridation officials continue to promote fluoridation with undiminished fervor, they usually refuse to defend the practice in open public debate – even when challenged to do so by organizations such as the Association for Science in the Public Interest, the American College of Toxicology, or the U.S. EPA (Bryson 2004). According to Dr. Michael Easley, a prominent lobbyist for fluoridation in the US, "Debates give the illusion that a scientific controversy exists when no credible people support the fluorophobics' view" (Easley, 1999). In light of proponents' refusal to debate this issue, Dr. Edward Groth, a Senior Scientist at Consumers Union, observed that, "the political profluoridation stance has evolved into a dogmatic, authoritarian, essentially antiscientific posture, one that discourages open debate of scientific issues" (Martin 1991).
50. **Proponents use very dubious tactics to promote fluoridation**. Many scientists, doctors and dentists who have spoken out publicly on this issue have been subjected to censorship and intimidation (Martin 1991). Dr. Phyllis Mullenix was fired from her position as Chair of Toxicology at Forsythe Dental Center for publishing her findings on fluoride and the brain (Mullenix 1995); and Dr. William Marcus was fired from the EPA for questioning the government's handling of the NTP's fluoride-cancer study (Bryson 2004). Many dentists and even doctors tell opponents in private that they are opposed to this practice but dare not speak out in public because of peer pressure and the fear of recriminations. Tactics like this would not be necessary if those promoting fluoridation were on secure scientific and ethical grounds.

Conclusion

When it comes to controversies surrounding toxic chemicals, vested interests traditionally do their very best to discount animal studies and quibble with epidemiological findings. In the past, political pressures have led government agencies to drag their feet on regulating asbestos, benzene, DDT, PCBs, tetraethyl lead, tobacco and dioxins. With fluoridation we have had a sixty-year delay. Unfortunately, because government officials and dental leaders have put so much of their credibility on the line

defending fluoridation, and because of the huge liabilities waiting in the wings if they admit that fluoridation has caused an increase in hip fracture, arthritis, bone cancer, brain disorders or thyroid problems, it will be very difficult for them to speak honestly and openly about the issue. But they must, not only to protect millions of people from unnecessary harm, but to protect the notion that, at its core, public health policy must be based on sound science not political expediency. They have a tool with which to do this: it's called the Precautionary Principle. Simply put, this says: if in doubt leave it out. This is what most European countries have done and their children's teeth have not suffered, while their public's trust has been strengthened.

Just how much doubt is needed on just one of the health concerns identified above, to override a benefit, which when quantified in the largest survey ever conducted in the US, amounts to less than one tooth surface (out of 128) in a child's mouth?

While fluoridation may not be the greatest environmental health threat, it is one of the easiest to end. It is as easy as turning off a spigot in the public water works. But to turn off that spigot takes political will and to get that we need masses more people informed and organized. Please get these 50 reasons to all your friends and encourage them to get fluoride out of their community and to help ban this practice worldwide.

Postscript

Further arguments against fluoridation, can be viewed at http://www.fluoridealert.org and in the book The Case Against Fluoridation (Chelsea Green, 2010). Arguments for fluoridation can be found at http://www.ada.org

Publication history of the 50 Reasons

These 50 Reasons were first compiled by Paul Connett and presented in person to the Fluoridation Forum in Ireland in October 2000. The document was refined in 2004 and published in *Medical Veritas*. See: http://www.fluoridealert.org/50reasons.htm In the introduction to this 2004 version it was explained that after over four years the Irish authorities had not been able to muster a response to the 50 Reasons, despite agreeing to do so in 2000. Eventually, an anonymous, incomplete and superficial response was posted on the Irish Department of Health and Children's website (see this response and addendum at:http://www.dohc.ie/other_health_issues/dental_research/. Paul Connett's comprehensive response to this response can be accessed athttp://www.fluoridealert.org/50reasons.htm We learned on August 7, 2011 that this governmental response was prepared by an external contractor at a cost to the Irish taxpayers' of over 30,000 Euros. See: http://www.independent.ie/national-news/staggering-sums-spent-on-reportscommissioned- by-the-state-2841922.html Since 2004, there have been many major scientific developments including the publication of the U.S. National Research Council report (NRC, 2006); the publication of Bassin's study on Osteosarcoma (Bassin 2006), and many more studies of fluoride's interaction with the brain, that have necessitated a major update of the 50 Reasons. This was compiled in August 2011.

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A Response to the Association of Local Public Health Agencies (aLPHa) press release Feb. 17, 2011 http://www.alphaweb.org/docs/lib_013681055.pdf

Page 1.

The use of fluoride in drinking water is a safe, effective, and economical way to help prevent dental cavities with ***no scientifically proven adverse health impacts*** (emphasis added)

I provide evidence below that this statement is not correct.

The fluoridation of drinking water has been used in Canada for over 40 years and between 1979 and 2009 the *incidence of dental cavities* (emphasis added) for children, adolescents and adults has dropped significantly; from 2.5% to 0.5% for children, from 9.2% to 2.5% for adolescents, and from 17.5% to 10.7% for adults.

First, this makes no sense. Does this mean 95.5% of children have no dental decay across Canada? That's not what the local surveys have found. This is misleading.
According to the Summary Report on the findings of the oral health component of the Canadian Health Measures Survey 2007-2009
"Although cavities are largely preventable, 96% of adults have had a history of cavities."
http://www.fptdwg.ca/assets/PDF/CHMS/CHMS-E-summ.pdf

The Fact Sheet to follow admits there are other reasons for this success (e.g. fluoridated toothpaste- see below).

According to estimates from the Center for Disease Control and Prevention, it costs about 50 cents per person to fluoridate community water and every $1 invested yields $38 in avoided costs for dental treatment.

This is misleading. You have to fluoridate for 20 to 30 years to save maybe one filling per person (according to the latest studies- see below). Only very large cities can keep the costs down and only because they use industrial waste by-product rather than purified fluoride chemicals. It can cost up to $3.50/person/yr. to fluoridate smaller communities. That's for every man, woman and child, whether they need fluoridation delivered to them or not. The cost of equipment repair, infrastructure upgrades, employee training, safety procedures, insurance, education, legal costs, etc. have not been included. Neither has the cost of treating dental fluorosis that is caused by water fluoridation. It can cost well over the cost of one filling per person to fluoridate the entire population.

The sources of this estimate is Griffin (2001) who is employed by the CDC and that 'analysis' makes many false assumptions.
Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. J Public Health Dent. 2001 Spring;61(2):78-86.

Other profluoridation researchers, for example, Campain (2010) have published that the savings may now be as low as $3.87/yr with no benefit to seniors.
Campain AC, Mariño RJ, Wright FA, Harrison D, Bailey DL, Morgan MV. The impact of changing dental needs on cost savings from fluoridation. Aust Dent J. 2010 Mar;55(1):37-44.

Maupome (2007) even showed that more money was spent on dental treatment for young people living in a fluoridated communities compared to non-fluoridated communities.
Maupomé G, Gullion CM, Peters D, Little SJ. A comparison of dental treatment utilization and costs by HMO members living in fluoridated and nonfluoridated areas. J Public Health Dent. 2007 Fall;67(4):224-33.

The "$1 fluoridation saves $38 dental costs" claim has been repeated over and over again by public health and is misleading and incorrect.

While many communities in Ontario continue the practice of fluoridating drinking water for the benefit of all their citizens, a small number of municipalities have made the decision to stop fluoridation in the past few years.

Almost the entire province of BC and the entire province of Quebec have decided to discontinue fluoridation. Recently Calgary in Alberta decided to cease fluoridation. Only Ontario has a large percentage of communities still fluoridating.

"The argument that fluoridation is no longer required because dental health has improved over the past decades is flawed. Dental health has improved in large part because of the addition of fluoride. Removing fluoride now doesn't make sense," says Valerie Sterling, alPHa President and member of the Toronto Board of Health

This also is incorrect. Modern studies (and an unreleased report by Dr. Hazel Stewart, Chief Dental Public Health Dentist for Toronto) show

1. Halting fluoridation will not increase dental decay
2. Decay rates are extremely low and that the purported benefits of fluoridation to the population can't be measured because they are so low.

In addition to fluoridation, alPHa is calling on the provincial government to provide support, including provincial legislation and funding to municipalities for the fluoridation of community drinking water. "We want to avoid what happened with tobacco legislation. We had a patchwork of local by-laws until the provincial government implemented the Smoke-Free Ontario legislation. A similar situation exists today with fluoridation resulting in some communities losing the benefit to their dental health," explains Sterling.

Making fluoridation mandatory, forcing municipalities to medicate their citizens, does not give all citizens the opportunity to provide informed consent to a medical treatment designed to treat an illness that occurs in a minority of the population and that can affect healthy people adversely.

Fact Sheet: Fluoride & Drinking Water
Fluoride is a mineral that occurs naturally in the environment. Fluoride is found in soil, air and water.

"Fluoride is an ion (F-), not a naturally occurring mineral. Fluorite (CaF2) is the naturally occurring mineral. Both are formed from their constitutive ions Fluorine (F-) and calcium (Ca++), the former from gaining one electron and the latter when two fluorine atoms combine with one of Calcium ion. Often

these different chemical distinctions are erroneously blurred by professionals and laity. The term "Fluorides" is an aggregate name given to substances containing fluorine. "Silicofluorides" is the correct term to describe a subset of fluorides used to fluoridate treated drinking water. Silicofluorides are only produced from anthropogenic (man-made) sources and are not naturally occurring in the environment." Quote provided by Peter van Caulart.

At appropriate levels, Fluoride in drinking water has been proven to significantly reduce cavities and dental decay.

Not a single double blinded, randomized clinical trial has been conducted. We need that for proof. We expect that for any drug approved by Health Canada.

Fluoridation studies do not correct for a delay in tooth eruption and are therefore all flawed (except for one-see below). Several studies have shown that fluoride delays tooth eruption.

Author (yr)	cities	[F^-]	n =	Age group (yrs.)	Delay (years)
Kunzel (1976)	Karl-Marx-Stadt Plauen	1.0 0.20	**56,612** (total)	4-15	 0.13-0.5 (premolars)
Tseng (1989)	Chun-Hsing New Village Tsao-Tin	1.0 control	**3,459** **4,610**	3-15	0.21 – 0.38 (premolars)
Virtanen (1994)	Laitila Ylivieska Muurame	0.5-4.0 0-0.2	**911**	3-21	0.82 (premolars) 0.4 (2^{nd}molars)
Bigeard (1997)	Strasbourg	1.0	**1977**	6-15	- in line with other fluoridated cities (data not shown)
Campagna (1995)	Boston Athens	1.0 control	**46** **42**	12.5	0.6 (boys) 1.7 (girls)
Nadler (1998)	1972-4 1992-4	Secular study	**76** **72**		1.21 (boys) 1.52 (girls)

The one study that did the correction for tooth eruption found no benefit of fluoridation (Komarek 2005)

Komárek A, Lesaffre E, Härkänen T, Declerck D, Virtanen JI. A Bayesian analysis of multivariate doubly-interval-censored dental data. Biostatistics. 2005 Jan;6(1):145-55.

Other confounding factors have never been considered (diet, Vitamin D exposure, etc.).
For example, even the York reviewers admitted the 'proof' is far from solid. It is actually quite weak. Modern studies looking at decay rates in the 90's and beyond were unable to show clinically significant benefits.

A summary of recent publications –fluoridation has little effect

Study Author and year	**Surfaces saved (out of 128)**
Brunelle 1990	**0.5**
Angelillo 1990	**0.6**
Ismail 1993	**0.7**
Clark 1995	**0.8**
Slade 1995	**0.2**
Jackson 1995	**2.0**
Heller 1997	**0.5**
Kumar 1998	**-0.2**
Selwitz 1998	**1.2**
Armfield 2004	**NS**
Komarek 2005	**NS**
Spencer 2008	**NS**
Nyvad 2009	**NS**
Ekstrand 2010	**1.0**
Armfield 2010	**0.5**

This finding is strongly supported by an extensive body of Canadian and international research

There may have been some benefit from fluoridation (although the evidence is weak) in the years of rampant decay (WW II), but not today. There are no modern fluoridation studies in Canada.

and has been commonly accepted in the scientific community for almost 70 years.

Only by the English-speaking dental public health scientific community. Many fluoride toxicologists, epidemiologists, and scientists from all over the word, including well known Nobel Laureates in non-fluoridated countries, have provided science to the contrary and have recommended not to fluoridate.

Scientific guidance on optimal fluoridation levels is routinely reviewed by expert panels convened by Health Canada and conveyed to all provinces and territories.
The most recent Health Canada review, undertaken in 2007, assessed the latest available evidence on the benefits and potential risks. This review concluded that there *is no harmful health risk* (emphasis added) from the fluoridation of community drinking water at current levels and that fluoridation continues to be an effective public health strategy to prevent dental disease.

The most recent Health Canada panel omitted some literature which is cited by the 2006 NRC report: http://www.nap.edu/catalog.php?record_id=11571

Not once was there any reference to the actual chemicals used in fluoridation.

The list of publications indicating fluoride harm that were published since the NRC Report can be found at: http://www.fluoridealert.org/since-nrc.html

Also the Health Canada panel was a panel dominated with known profluoridationists.

Dr. Christopher Clark
-Dr. Clark is a public health dentist/retired professor (UBC) and a known profluoridationist. Even so, his own studies in BC showed that as communities stopped fluoridation, the decay rates continued to drop, but did not change that much in the fluoridated control city.

Dr. Stephan Levy
-Dr. Levy is a public health dentist/researcher (College of dentistry, Iowa) and has published several papers from a multimillion dollar US NIH grant trying to prove fluoridation benefits. His work has shown that fluoridated children are over-exposed to fluoride, have disfigured teeth (dental fluorosis), and have bones that are negatively affected by fluoridation and yet he continues to promote water fluoridation.

Dr. Jayanth Kumar
-Dr. Kumar is a public health dentist (New York State Department of Health) who regularly advises the ADA and promotes water fluoridation in New York State. He served on the 2006 NRC Panel as a dentist supporting fluoridation. His own research shows that the difference between fluoridated communities and non-fluoridated is no longer measurable. However, he has published that the disfigurement of fluoridation in terms of dental fluorosis has increased throughout the years, largely due to water fluoridation.

Dr. Michel Lévy
-Dr. Lévy is a public health dentist from the Institut National de Santé Publique du Quebec. He has published one review on fluoride in the literature.

Dr. Robert Tardif
-Dr. Tardif is a professor (PhD only) in the Department of Environmental and Occupational Health, University of Montreal. He has not published any article in the peer-reviewed literature. He seems to be the author of a draft report (2007) on the toxicology of fluoride written for Health Canada in which he had concerns that water at less than 1.0ppm might cause lowered IQ, and could be linked to cancer (these concerns were not repeated in the

Health Canada report of 2010). He also participated in the review of fluoridation for Quebec (Report from the Institut National de la Santé Publique du Québec : *Fluoration de l'eau: analyse des bénéfices et des risques pour la santé*.)

Dr Albert Nantel
-Dr. Nantel is a physician from the Institut National de la Santé Publique du Quebec. He has never published any peer-reviewed papers on fluoride. He also participated in the review of fluoridation for Quebec (Report from the Institut National de la Santé Publique du Québec, *Fluoration de l'eau: analyse des bénéfices et des risques pour la santé*, which, according to critics in Québec, was full of errors and false statements.

Dr. Steven Levy, the primary external fluoridation expert on the Health Canada panel, has published studies showing that determining optimum fluoride levels in drinking water is 'problematic' (Warren, Levy et al, 2009) ,
Warren JJ, Levy SM, Broffitt B, Cavanaugh JE, Kanellis MJ, Weber-Gasparoni K. Considerations on optimal fluoride intake using dental fluorosis and dental caries outcomes--a longitudinal study. J Public Health Dent. 2009 Spring;69(2):111-5.

that fluoride intake can't be controlled by parents, that fluoridated water used to make infant formula leads to dental flurosis (Levy, 2010)

Levy SM, Broffitt B, Marshall TA, Eichenberger-Gilmore JM, Warren JJ. Associations between fluorosis of permanent incisors and fluoride intake from infant formula, other dietary sources and dentifrice during early childhood. J Am Dent Assoc. 2010 Oct;141(10):1190-201.

and fluoridation even leads to negative bone changes in children (Levy 2009).
Levy SM, Eichenberger-Gilmore J, Warren JJ, Letuchy E, Broffitt B, Marshall TA, Burns T, Willing M, Janz K and Torner JC. Associations of fluoride intake with children's bone measures at age 11. Community Dent Oral Epidemiol 2009; 37:416–426.

Health Canada failed to calculate a risk factor to protect susceptible Canadians and simply settled on 0.7 ppm for the new recommended level (over which it has no legal jurisdiction or accountability)

The City of Toronto's policies and practices in drinking water fluoridation are guided by these expert reviews and recommendations.

The City of Toronto was not told about the documented side effects.

Toronto Public Health and Toronto Water are committed to ensuring the safety of the Toronto drinking water supply, and protecting the health of Toronto residents.

There have been no safety studies on the actual man-made chemicals that are injected into our drinking water. They contain contaminants such as the cancer-causing element arsenic.

The dental benefits and safety of fluoridation of drinking water are strongly supported by many health organizations, including the Ontario Medical Association, the Canadian Dental Association, the Ontario Dental Association, the American Dental Association, the Public Health Dentists Association,

These organizations advise but do not conduct original research. Original research is conducted by scientists who could be funded by government or by industry. Fluoride toxicology research seldom appears the journals own by these organizations.

the Chief Dentist of Canada

Dr. Cooney organized a Canadian national survey. The examinations sites were selected non-randomly and dominated 2:1 by non-fluoridation sites. None of the data has been statistically analyzed with acceptable scientific methods (using regression analysis to adjust for confounding factors). Nor has any of the data been subject to peer review and published in the dental literature.

and the International Association for Dental Research.
The IADR has built a reputation on fluoride research. Many of its members have received grants from governments and industry to show fluoride's benefit. There are IADR awards for fluoride research. It is difficult for this organization to now concede that fluoridation no longer works and may be harmful.

Fluoride has been added to the Toronto drinking water supply since 1963.

Which means some Torontonians have built up so much fluoride in their bones that their bones are at higher risk for fracture (Chachra, 2010)

Chachra D, Limeback H, Willett TL, Grynpas MD. The long-term effects of water fluoridation on the human skeleton. J Dent Res. 2010 Nov;89(11):1219-23.

Studies of Toronto children 12 years after the introduction of water fluoridation and again in 2000 show that by 2000, there was a 77.4% mean reduction in decayed, missing and filled baby teeth for five year-old children. There was also a 390% increase in the percentage of children with no tooth decay when compared to rates reported prior to the addition of fluoride in 1963.

No peer-reviewed publication to report this result can be found. If these data are from public health surveys, how can one determine if the study was done correctly if they haven't been published and are kept secret from the public?

This dramatic improvement in dental health is due to a combination of water fluoridation, other sources of fluoride (such as toothpaste), better nutrition and better dental preventive care. Water fluoridation plays an important role in a comprehensive approach to good dental health.

If you don't measure the benefits from toothpaste use, better nutrition and better dental preventive care, you simply cannot measure how much benefit came from fluoridation.

The current target level of fluoride in Toronto drinking water is 0.6 parts per million - a level which is less than the naturally occurring fluoride levels from a number of European and North American water sources, including parts of Ontario.

And is still far too high for making infant formula. That level puts infants at undo risk for dental fluorosis and other known side effects (Levy, 2010)

Levy SM, Broffitt B, Marshall TA, Eichenberger-Gilmore JM, Warren JJ. Associations between fluorosis of permanent incisors and fluoride intake from infant formula, other dietary sources and dentifrice during early childhood. J Am Dent Assoc. 2010 Oct;141(10):1190-201.

Fluoride levels in Toronto's drinking water are regulated in Ontario under the Safe Drinking Water Act administered by the Ministry of the Environment.

This is incorrect.
The Safe Drinking Water Act of Ontario does NOT dictate how much fluoride should be in the drinking water. That is determined by each municipality which must decide whether to fluoridate, with which chemical, and at what level. Municipalities are guided by Provincial and Federal 'recommendations'.

The expert opinions expressed in this critique are those of Dr. Hardy Limeback BSc PhD DDS, Professor and Head of Preventive Dentistry, University of Toronto, and offered here without prejudice.

Health Canada - Guidelines for Canadian Drinking Water Quality

Guideline Technical Document – Fluoride – December 2010

Critique by Diane Sprules, BSc, MSc.

Jan 2012

1. Expert Panel
2. Hydrofluorosilicic acid
3. Hip Fractures
4. Thyroid Gland
5. Dental Fluorosis
6. Fluoride Not a Nutrient
7. Omissions from panellist Tardif's Report
8. Pineal Gland
9. Osteosarcoma
10. Infant Formula
11. Conclusion

1. HC – *States that the Chief Dental Officer of Health, Dr. Peter Cooney, sought external expert advice from the dental community (pg 2 of report).*

But fluoride affects the whole body not just the teeth. This panel of six consisted of four dentists, two of whom are public health dentists, a public health doctor and a PhD in community health. All were known profluoridationists. Dr. Cooney did NOT pick an impartial panel.

2. HC – *Did not discuss the chemical, hydrofluorosilicic acid (HFSA), which is used to fluoridate most communities and which has* ***never been tested for safety and efficacy****.*

It is a highly toxic waste product collected from the scrubbers of the smokestacks of phosphate fertilizer plants.

3. HC –*Concludes that evidence does not support a link between water fluoridation and any adverse health effect (pg 1 of report).*

Yet its own report finds the preponderance of hip fracture studies in seniors over 50 years old showed artificial water fluoridation to be associated with hip fractures (pg 28-29 of report).

7 studies showed a higher hip fracture rates in fluoridated communities
3 studies showed no difference.
1 study showed fewer hip fractures in fluoridated communities

These results are consistant with Dr. Miloslev Nosal's analysis of hip fractures and water fluoridation. Dr. M.Nosal is a biostatistician at the Univ of Alberta who wrote a letter to this effect to the city of Calgary which recently voted to stop fluoridating its water. http://www.fluoridation.com/CalgaryFluoride/Calgary-Fluoridation-ProfNosal.pdf. He was the one member of the expert panel who voted against fluoridation for the city of Calgary in 1999 and he wrote a dissenting report based on the hip fracture data.

Hip fractures are increasing. Fluoride increases in bone with age. Fluoride makes bones more brittle.

4. HC – *Did not show fluoride to be safe for the thyroid gland.*

There were no human studies on the thyroid and fluoride reviewed. There were two animal studies that showed harm at high levels.

Sodium fluoride was used in the past century to treat **hyper**thyroidism. Today in Canada we have an epidemic of **hypo**thyroidism, or low thyroid. Synthroid used to treat hypothyroidism is the second most prescribed drug in Canada.

HC - *Says Canadians will not suffer effects of fluoride on the thyroid because we ingest more than 1mg/day of iodine (pg 39 of report)*

This is 3-5 times the iodine intake of Americans (over 1 mg/day compared to 0.2-0.3 mg/day in the U.S.). This "fact" cited from the Institute of Medicine (IOM) 2001, sounds pretty current. Either HC did not check this reference or chose to omit the fact that the iodine intake was based on a much older Canadian government report printed in 1987. Data from that time and earlier may have reflected the use of iodate in bread and as a disinfectant and a very different diet than most Canadians presently eat. Iodized salt is available in both countries and diets are not that dissimilar. It is likely that iodine intake is similar to that in the U.S. and much lower than HC states.

Hypothyroidism can be a serious condition as the thyroid gland affects many bodily functions. Low thyroid poses a risk to the fetus and a recent study in NY State has shown preterm births to be higher in fluoridated communities.
http://apha.confex.com/apha/137am/webprogram/Paper197468.html

Dr. John Doull, the panel chair of the NRC 2006 Report on Fluoride in Drinking Water (U.S.) stated regarding water fluoridation, "The thyroid changes do worry me."

5. HC - *Finds moderate dental fluorosis an adverse effect based on its potential cosmetic concern (pg 1 of report).*

Based on a recent HC survey of 15 Canadian fluoridated and unfluoridated cities, HC says that fewer than 0.3% of Canadian children 6-12 years old have moderate - severe dental fluorosis. HC found only 60% of children had normal enamel. 16% had fluorosis and 24% were "questionable" – had some white spots (pg 55 of report). HC did not document which cities in its study were fluoridated and what the fluorosis rates were by city.

When surveying dental fluorosis rates it is important to compare rates between fluoridated and unfluoridated cities yet HC has not disclosed these details.

Over the last 10 years Halton public health has documented between 4.6 and 10.8% of teenagers with moderate-severe fluorosis. **This is 15 to 36 times the rate HC found. Or 1500-3600% higher.** Dental fluorosis is very apparent in our community and moderate fluorosis can be very costly to fix with veneers.

6. HC – *states correctly that fluoride is not essential for growth and reproduction (pg 24 of report).*

This is **unlike** iodine in salt, vitamin D in milk or folic acid in bread. Often Public Health officials will wrongly compare fluoridation with other supplementation of nutrients.

7. HC – *omitted important facts from the toxicology report prepared by one of its panel, Dr. Robert Tardif of the University of Montreal.*

In that report (Toxicology of Fluoride, 2006) Tardif reviews the uterine cancer studies from Okinawa, Japan (http://www.ncbi.nlm.nih.gov/pubmed/9002384). Uterine cancer was shown to have increased significantly in 20 municipalities in Okinawa after they were were fluoridated. Japan no longer fluoridates.

Tardif also states in his report that the impact of fluoride on intelligence (cognitive effects) seems to occur at levels **less than 1.0 ppm** and that further investigation is needed. Since 2006 more than 20 studies have shown a relationship between fluoride and intelligence. They are from India and China and they have been discredited by Health Canada (pg 37 of report). A recent Indian study showed that IQ levels in children with no fluorosis were higher than those with fluorosis and the lowest IQ's were associated with more severe fluorosis. http://www.ncbi.nlm.nih.gov/pubmed/21911949

Yet **no** intelligence studies have been done in Canada or the U.S. which Tardif suggests are needed.

8. HC- *included Dr.Jennifer Luke's study that showed the effect of fluoride on the pineal gland of gerbils. This study showed that fluoride lowered melatonin levels and caused early female maturation (pg 23 of report).*

HC did not report that early human female maturation was found after only five years in the Newburgh – Kingston NY study, a study which HC chose not to review even though it was set up to compare the health consequences in two cities, one fluoridated and one unfluoridated.

9. HC – *Takes more credence than warranted from a letter written in 2006 by Dr.Chester Douglass promising an upcoming publication that says it would refute his own student's published thesis (pg 34 of report).*

Douglass' paper (http://www.ncbi.nlm.nih.gov/pubmed/19390788) was published more than five years after Bassin's (http://www.ncbi.nlm.nih.gov/pubmed/16596294) and after the HC report. It was not comparable to Bassin's study, which is considered to be of high quality, and it did not weaken Bassin's conclusions.

Bassin concluded that there is approximately a five times higher chance of getting osteosarcoma for young males living in a fluoridated city. Osteosarcoma is rare but it is frequently fatal. There have been cases in Halton.

10. HC –*Table B3 of the report: http://hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/b-table-b-tableau-eng.php#tab3*

This table shows that babies fed milk-based formula made with fluoridated water will receive a fluoride intake that is **3300% higher** than the adequate intake (AI) set by the Institute of Medicine (IOM).

In the U.S. the American Dental Association and the Centers for Disease Control both advise using unfluoridated water to mix formula if mothers wish to avoid dental fluorosis. But not Health Canada.

11. Conclusion

This report does not reassure Canadians that artificial water fluoridation is safe and effective.

There is evidence that hydrofluorosilicic acid may be negatively affecting many organ systems of the human body, including the teeth.

In the last 14 months, 13 Canadian communities, totalling approximately 1,638,000 people, have voted to stop artificial water fluoridation in their communities. No Canadian communities have started fluoridation during this period.

The Precautionary Principle should be applied.

From: Aaron Switzer [mailto:aaron.j.switzer@gmail.com]
Sent: Thursday, March 22, 2012 10:18 AM
To: JASON COVEY
Subject: Re: Speaking at the Public Forum on May 29/12

Mr. Covey,

Thank you for your consideration regardless. May I ask some details about the format of the second public forum? May I submit my name to possibly ask questions about the draft report after I hear it's details during the presentation? If so, please include my name on the list of members of the public who may have the opportunity to ask questions post-presentation at the Council Chambers and send me confirmation of such approval. If there is a different protocol to this procedure would you be able to clarify it for me so I may be able to make the preparations necessary to participate?

Thank you for time.

Sincerely,

Aaron Switzer

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of wilfredwong1980@yahoo.ca
Sent: Thursday, March 22, 2012 11:11 AM
To: JASON COVEY
Subject: No to Fluoridation

I'm not really one to get involved in municipal issues, but ever since my wife and I recently became new home owners and tax payers in Orillia, it's hard not to pay attention to what's going on in our community. My stance on the issue is that as a taxpayer, I don't want to fork out any more than I have to, knowing that fluoridating our water is not going to solve our tooth decaying problem in the community. I'm sure everyone knows that brushing your teeth in the morning and evening is one huge step in preventing tooth decay, but are people doing it? Maybe there are families who don't care about dental hygiene or lack the education of the repercussions of not following a basic teeth brushing routine. I think it's unfair for the people who do brush their teeth to fork the bill for floridation for the benefit of people who don't. I think it comes down to just laziness. There are those who brush and those who do not. There are those who rather spend a dollar for a chocolate bar that will bring 5 minutes of bliss than a tube of toothpaste at the local Dollarama that will provide at least a month's worth of adequate dental hygiene. That's my 0.02.

From: Thomas Tiveron [mailto:tiveron.t@gmail.com]
Sent: Thursday, March 22, 2012 3:58 PM
To: JASON COVEY
Subject: Re: Water Fluoridation Question

Thomas Tiveron
324 Harvey St
705-327-2114, tiveron.t@gmail.com

If Orillia chooses to add fluoride to their water supply, where will the water be checked post fluoridation for lead and arsenic levels?
As well, especially for the West Ridge well pumping station, would this require an expansion? What will the additional costs be, in addition to the cost of the fluoride system?

Regards,

Thomas Tiveron

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Thursday, March 22, 2012 7:46 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden
Cc: JASON COVEY
Subject: City of Orillia Webpage On Fluoridation - Susan Schweitzer

Dear Mayor Orsi and Orillia City Council,
I received this submission, today, from James Beck. His credentials are on the attachment. Please, review it.
I request that you allow the opposed to fluoride side of the issue to appear side-by-side with the pro fluoride side of the issue (Public Health), on the fluoridation webpage, to give a balanced perspective to the fluoride issue rather than a biased one.
Please, respond to this request as soon as possible.
Thank you, Susan Schweitzer
Jason, please add this email to the process regarding Orillia water fluoridation. Thank you.

Responses to Misinformation on the Orillia City Website

It is misleading to say that fluoride is found in rocks without pointing out that the natural form found in the earth's crust and therefore in the natural sources of city water is calcium fluoride which yields fluoride ions in water to a much lesser extent than the hexafluorosilicic acid (HSFA) or its sodium salt that is used to fluoridate. And to say that the "optimal fluoride concentration…for the control of tooth decay is between 0.5 and 0.8 mg/L…" is misleading without mentioning that HFSA reacts differently to the acidic contents of the stomach to produce harmful chemicals. Besides, the phrase "optimal fluoride concentration" begs the question of the effectiveness of fluoride (it is not effective by swallowing, so there is nothing "optimal" about it) and ignores the critical facts that controlling concentration in tap water does not control dose, given that people drink vastly different amounts of water and are exposed to fluoride in food and processed drinks.

Research that stands up to thorough examination shows little or no preventive effect. One of the best studies shows that children who drink fluoridated water at 1.0 mg/L fluoride have 0.6 fewer affected tooth surfaces out of 128 surfaces. That "benefit" can be calculated unrealistically as a 17% improvement or realistically as 0.4% improvement. Research does show that topical application as occurs using fluoridated toothpaste slightly reduces incidence of cavities.

The statement that "scientific studies have not found any credible link between water fluoridation and adverse health effects" other than dental fluorosis is blatantly incorrect. There are hundreds of peer-reviewed scientific reports in credible journals exposing associations with adverse effects on kidney, heart and blood vessels, thyroid system, reproductive system, brain and bone among others. Some of these effects are well supported by science; others are less so but certainly call for more research before whole populations are exposed to the risks.

That fluoridation is supported by the mentioned agencies of fluoridating countries and trade organizations is hardly reassuring since they have habitually ignored much scientific evidence and for some time now have been hedging their recommendations. The Centers for Disease Control and the American Dental Association admitted in 1999 that fluoride's effectiveness is due to topical application to teeth, not to swallowing fluoride.

The dangerous contaminants of the HFSA used to fluoridate may be "low" (that requires definition) but some such as lead, arsenic and radioactive elements very likely produce toxic effects at levels undetected by most investigations—not to say that investigations have been done. Given the possible

consequences, including death, it is irresponsible to use an untested, unapproved, unpurified substance for fluoridation even if it were effective.

The statement “Dental fluorosis is not a disease” is patently misleading. The mild dental fluorosis described can be a serious condition because of its effects on the social behaviour and mental state of the sufferer, particularly a teenager. Furthermore, dental fluorosis includes moderate and severe (these are technical terms used in grading the condition) which include pitting, discolouration, brittleness and cavities. Dental fluorosis afflicts over 30% of the population of the United States (we don’t have reliable data for Canada), 41% of children 12 to 15 years old. About 3 or 4% of these are cases of moderate or severe fluorosis.

It would be appropriate for Orillia’s website to offer substantiated information rather than the usual propaganda of promoters of fluoridation.

James Beck, M.D., Ph.D. (biophysics), co-author of The Case Against Fluoride (2010), Professor Emeritus of Medical Biophysics, University of Calgary
beck@ucalgary.ca

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Thursday, March 22, 2012 9:09 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; charles.gardner@smdhu.org; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Subject: An article from a very respected MD.

Orillia Council and Public Health Officials;

Please read the following link from Dr. Mercola.
http://articles.mercola.com/sites/articles/archive/2010/11/13/cdc-and-ada-now-advise-to-avoid-using-fluoride.aspx

I have been following Dr. Mercola on many topics and have found his articles to be very informative, accurate and to the point.

After many years as a practicing family doctor, he decided that the best way to help people stay healthy, was to "take on" the established medical system which is very intent on supporting big pharma and not necessarily interested in a whole lot of "well" people walking around. "Everyone " makes a lot more MONEY if we are all sick to some extent and dependent on TOXIC drugs - which are very expensive, with HUGE profit margins.

Dr. Mercola's take on an issue usually aligns 100% with Naturalpathic doctors, Nutritional Consultants, Holistic Dentists and a whole host of Professionals WHO ARE INTENT ON THE HEALTH AND WELL BEING of people, and as a result, has more people reading his website than any other in history!

I include a direct quote from this article:
"There are plenty of studies showing the dangers of fluoride to your health, such as:

- Increases lead absorption
- Disrupts synthesis of collagen
- Hyperactivity and/or lethargy
- Muscle disorders
- Brain damage, and lowered IQ
- Arthritis

- Dementia
- Bone fractures
- Lowers thyroid function
- Bone cancer (osteosarcoma)
- Inactivates 62 enzymes
- Inhibits formation of antibodies
- Genetic damage and cell death
- Increases tumor and cancer rate
- Disrupts immune system
- Damages sperm and increases infertility

As far as tooth decay is concerned, this is not caused by lack of fluoride."

This sure sounds like the main reason for fluoridation is to "subtly" make us all sick, as discussed above!

These effects are all referenced in his document.

Please read this whole document.

Please enter this data into the public record for the water fluoridation issue.

I have full confidence that you will do the right thing and VOTE NO to fluoridation!

If any of you would like to meet person to person and discuss this issue further, I would be very pleased to accommodate your busy schedule ASAP.

Sincerely
Steve Goulter

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Thursday, March 22, 2012 10:39 PM
To: JASON COVEY
Subject: Fluoridation Equipment questions and request for FMEA documents.

Jason;
In looking at the "METCON" brochure, it appears that the water fluoridation equipment "treats" the water flowing thru a 1 inch line. All city water must flow in at least a 6 inch pipe. Please can you help me to understand how this system works in detail?

Have you made a trip to say Gravenhust or Bracebridge to see this equipment as installed?

I am still concerned about the Failure Modes and Effects Analysis. Please could you send me a copy of the FMEA for the system in its installed environment that shows a detailed analysis of every conceivable failure and the consequences of each failure mode. As you know, this type of analysis is require for every system and every component in that system. This is of paramount importance for a system such as this, where a failure could potentially kill or seriously injure citizens. I am specifically concerned about what happens when the water flow stops, the toxic Hexafluorosilicic Acid (HFSA) still flows, making the concentration of HFSA shoot up to very toxic levels, then the water flow starts up again, delivering this "slug" of very harmful "water" to your kitchen tap. WHAT HAPPENS IN THIS

CASE - DOES ANYONE EVEN KNOW ITS HAPPENED? The FMEA will outline this in detail.

I also request that the FMEA be entered into the public record for the fluoridation issue.

Thanks for your help.
Steve.Goulter

From: Scott Miller [mailto:scott.miller.3@gmail.com]
Sent: Friday, March 23, 2012 11:11 AM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden; Patrick Kehoe
Cc: JASON COVEY
Subject: Please update your Fluoride page! It is FAR TOO BIASED! Let's go for openness as promised!

Thank you.

Scott Miller

From: Victoria Leck [mailto:vleck@cdha.ca]
Sent: Friday, March 23, 2012 4:32 PM
To: JASON COVEY
Subject: fluoridation

Attached please find a letter of support for continued water fluoridation in Orillia.
Thank-you.
Victoria

Victoria Leck, RDH, BHA
Manager of Professional Development
Gestionnaire du développement professionnel
The Canadian Dental Hygienists Association
L'Association canadienne des hygiénistes dentaires
96 Centrepointe Drive, Ottawa, ON K2G 6B1
t: 613-224-5515 x128 • 1-800-267-5235
f/t: 613-224-7283
vleck@cdha.ca • www.cdha.ca

March 23, 2012

Jason Covey, P. Eng.
Water & Wastewater Engineer
Public Works, Engineering Division
50 Andrew Street, South
Orillia, Ontario L3V 7T5

Dear Mr. Covey,

Serving the profession since 1963, CDHA is the collective national voice of more than 24,000 dental hygienists working in Canada and we directly represent 16,500 individual members including dental hygienists and students, including 20 who live Orillia.

The Board of Directors endorsed our position statement on community water fluoridation on September 29, 2011. An excerpt is found below.

The CDHA

- Endorses the use of fluoride as an important oral health promotion and disease prevention approach
- Recommends that water fluoridation be maintained and extended to additional communities where feasible
- Encourages ongoing fluoridation research
- Recommends that information be made available to the public on the sources and quality of fluoride used in oral health products and water supplies

Water fluoridation has been called one of the top ten most significant breakthroughs in public health of the 20th century (www.cdc.gov/fluoridation/factsheets). Oral care is not universally covered in Canada and many people are not able to access regular dental care because of the costs. Water fluoridation is a safe, effective and inexpensive method to reduce the burden of tooth decay among all residents, including those most economically disadvantaged for whom regular visits with a dental professional are not affordable.

The CDHA strongly encourages council to continue fluoridating the water to protect the oral health of all residents of Orillia.

For better oral health,

Victoria Leck
Manager, Professional Development

THE CANADIAN DENTAL HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES

96 Centrepointe Dr., Ottawa, Ontario K2G 6B1 Tel.: (613) 224-5515 Fax: (613) 224-7283
E-mail: info@cdha.ca Toll Free: 1 800 267-5235 Website: www.cdha.ca

From: dianne orton [mailto:diniii@distributel.net]
Sent: Sunday, March 25, 2012 11:19 AM
To: Jason Covey
Cc: Michael Fogarty; Andrew Hill; Paul Spears; Linda Murray; Patrick Kehoe; Tony Madden; Pete Bowen; Don Jenkins
Subject: Time Line: Hydrofluorosilicic acid is an Inorganic Fluoride - Toxic Substance & Hazardous Waste

Hi Jason: I would like you to enter this information as part of the Public Record re: The Fluoride Issue.

http://www.newmediaexplorer.org/chris/Clinch_2009_Time_Line.pdf

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From: margaret ford [mailto:clarevand@gmail.com]
Sent: Monday, March 26, 2012 12:25 PM
To: JASON COVEY
Subject: Water fluoridation

Dear Jason Covey,

A minor indisposition, coupled with stormy weather, prevented me from being part of the Raging Grannies contingent at the Public Consultation on February 29th, but I should like to comment on the subject, fluoridation of our water supply.

I've no claim to especial knowledge on this topic but have made a rough survey of the arguments put forward by experts on both sides of the issue. The fact that they don't agree suggests to me that there is a case for caution in this matter. Before compulsorily medicating the entire population of Orillia, might we consider alternatives?

There is a strong correlation between inadequate or improper nutrition and tooth decay but although I was born into a poor family in the Depression in the early 1930s I still have my own teeth in serviceable condition. The reasons for that happy state may be useful to consider in the present situation. The first is genetic, and there's not much we can do about that.

The second is adequate and well-considered nutrition, both for pregnant women and for their children. Though they didn't stretch to luxuries, my father's wages were adequate to provide necessities. Many famillies in Simcoe County fall below this level, and that affects dental health. Minimum wages need to rise. My mother was a sensible shopper and a skilled cook so our diet was plain, but varied and healthy, supplemented by a good supply of vegetables and fruit from the extensive garden maintained by my father. Since we lived in the country we also regularly gathered wild food such as mushrooms, berries and nuts. During the war, sugar and candy was in very limited supply, so we were spared that assault on our teeth.

Next, travelling dentists visited every school, set up there for a day or two, examined every tooth in the place, repaired those that needed it, and dispensed advice on maintaining them in good condition. This service was free, and prevented irreparable damage in the future. If a country at war could provide this service, what's stopping this prosperous country from doing the same now?

Lastly, after the war Britain instituted a national dental health service which continued the good work, at little or no cost to the users. If we in this prosperous country can find the money to send expensively equipped military missions to pursue futile wars in places like Afghanistan, why can't we find it to protect our children's health here at home?

Similar measures would address the poor dental health in this region without the risk of introducing excessive amounts of fluoride into infant formula or into the diets of the frail and elderly; or further contaminating our already compromised sources of drinking water.

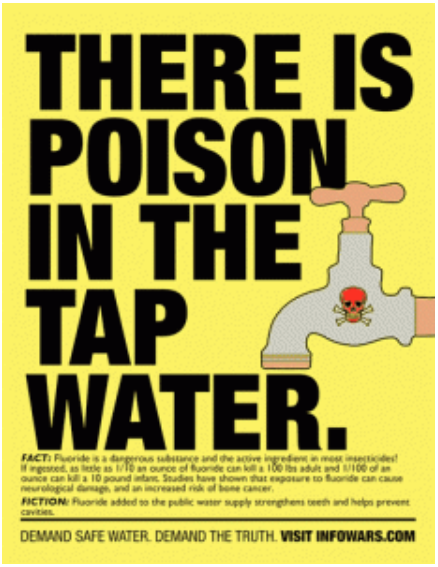
Easy fixes rarely work well, and fluoridating the water supply looks suspiciously like one such. It is no substitute for the intelligent social measures that would really improve the situation.

in peace
Margaret Clare Ford

From: dianne orton [mailto:diniii@distributel.net]
Sent: Monday, March 26, 2012 2:18 PM
To: Jason Covey
Cc: Michael Fogarty; Andrew Hill; Paul Spears; Linda Murray; Patrick Kehoe; Tony Madden; Pete Bowen
Subject: Fw: Study Proves Fluoride Brain Damage

Study Proves Fluoride Brain Damage

Posted: 02 Dec 2011 09:14 PM PST



A study conducted by scientists in India demonstrates that consumption of sodium fluoride results in brain and neurological damage. It was published by K. Pratap Reddy of the University College of Sciences at Osmania University in Hyderabad, India, on January 10, 2011.

The study was performed on rats for a period of 60 days. Fluoride resulted in neurodegenerative changes and morphological alterations were observed in the neocortex, hippocampus and cerebellum areas of the brain and also the spinal cord and sciatic nerve.

In 1995, Dr. Phyllis Mullenix and her colleagues found that fluoride studies in rats "can be indicative of a potential for motor dysfunction, IQ deficits and/or learning disabilities in humans."

"High levels of fluoride in drinking water (1-12ppm) affect central nervous system directly without first causing the physical deformities of skeletal fluorosis." Reddy writes in the Journal of Medical and Allied Sciences. Damage to the hippocampus often results in hyperactivity and cognitive deficits.

Numerous studies conducted in China, India, Iran, and Mexico have determined that fluoride exposure is associated with IQ deficits in children.

The correlation between fluoride exposure and diminished IQ was underscored earlier this year after the results of a study in China were published. "A recent Chinese study concluded that low dose sodium fluoride in drinking water diminishes IQ, especially among children. This is the twenty-fourth such international study with the same conclusion. Sodium fluoride has also been linked to reduced fertility and lower sperm counts," Paul Fassa wrote for Natural News in April.

In addition to the Chinese study, and 23 other IQ studies, there have been over 100 animal studies linking fluoride to brain damage, according to the Fluoride Action Network. The Indian study is the most recent.

The Chinese study "should be the study that finally ends water fluoridation. Millions of American children are being exposed unnecessarily to this neurotoxin on a daily basis. Who in their right minds would risk lowering their child's intelligence in order to reduce a small amount of tooth decay, for which the evidence is very weak," explains Tara Blank, Ph.D., the Science and Health Officer for the Fluoride Action Network.

The Indian study is available as a PDF here. It is an invaluable asset for activists attempting to get rid of the deadly neurotoxin sodium fluoride from our drinking water and food products.

SOURCE: Kurt Nimmo, Infowars.com, December 2, 2011

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Monday, March 26, 2012 3:15 PM
To: JASON COVEY
Subject: Re: City of Orillia Webpage On Fluoridation - Susan Schweitzer

Just a quick note that it is Dr. Beck (M.D. and Ph.D.). I just want to make sure that his credentials are clear. Yes, I remember about the public presentations, but his concern is not that the public presentations weren't posted. It is that the Fluoridation page on the city website does not include the viewpoints of the anti water fluoridation side of the issue. He is a co-author of "The Case Against Fluoride", and he doesn't think the Fluoridation page is unbiased or correct, as it concerns actual water fluoridation information. Thanks, Jason.
I do want to thank you and Percival, also, for taking the time to meet with Heather Gingerich (medical geologist) and me. I think it was a very worthwhile session. I hope there was information exchanged that was not previously brought to light. If there are any resources you require or any clarification that you need, please, let me know. Please, include what Heather and I had to say, as part of the Orillia process. Thanks, again. Susan 705-329-4908

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Monday, March 26, 2012 3:27 PM
To: JASON COVEY
Subject: Susan Schweitzer

Jason, please, accept this to the formal process on Orillia Water Fluoridation. Thank you. Susan

Professional Perspectives On Water Fluoridation

http://www.youtube.com/watch?v=88pfVo3bZLY

From: Rod & Carmen Langford [mailto:rod.carmen.langford@rogers.com]
Sent: Monday, March 26, 2012 7:39 PM
To: JASON COVEY
Subject: Proposed Fluoridation of Orillia Municipal Drinking Water

Good evening Mr. Covey.

After having reviewed a significant amount of the information posted on the City's website and the stories published in the Packet & Times to date, we wish to advise that we are opposed to the addition of fluoride in Orillia's municipal drinking water supply.

We have lived in Orillia for nine years and neither my husband or I have any dental health issues. Our seven year-old son, who has consumed Orillia's water all his life, is also cavity free and has very healthy teeth. We have been very diligent in teaching our son the proper way to brush and floss, starting as an infant, and this approach to dental care has worked to date. An acquaintance of ours who lives in Bracebridge, which has fluoridated drinking water, has a four year-old daughter who has several dental and tooth decay issues. Another acquaintance of ours who is almost 30 and grew up in Port Carling, also which has fluoridated drinking water, also has many cavities. These three examples alone go a long way in illustrating that adding fluoride to a municipal drinking water supply does not significantly help in improving dental health or limiting the effects of tooth decay or cavities.

Perhaps a more appropriate use of funds would be to take the cost of the supply and on-going operation of the fluoride system and use it for a public education/assistance program, offer tooth brushes and toothpaste to school age kids,

contribute to the healthy eating programs in schools, etc. This allows those that need dental health assistance able to access these programs, and does not force fluoridation on all those connected to the municipal supply, whether they want it or not.

Thank you for considering our comments.

R & C Langford
Franklin Street
Orillia, ON
email: rod.carmen.langford@rogers.com

-----Original Message-----
From: Robert Sparkes [mailto:rsparkes@csolve.net]
Sent: Monday, March 26, 2012 9:33 PM
To: MAYOR EMAIL
Cc: Paul Spears
Subject: Fluoridation of City Water

MAYOR ORSI: I want to express my concern about the proposal to fluoridate. Surely there has been enough research & experience on this topic by now. It is not the fluoride consumed, but the topical application which is beneficial. We would be better off providing toothpaste & brushes to school children.

Deacon Bob Sparkes, Guardian Angels Church

From: Kathie Joblin [mailto:kathiejoblin@rogers.com]
Sent: Monday, March 26, 2012 10:15 PM
To: Tony Madden; Andrew Hill; MAYOR EMAIL
Cc: JASON COVEY
Subject: fluoride in the water -- NO!

Dear Ward Four Councillors and Mayor

I am deeply concerned that you are actually seriously considering pursuing the dangerous and potentially illegal action of adding fluoride to the water supply of the City of Orillia. Please accept this electronic letter as the strongest possible protest from this concerned citizen. I DO NOT WANT fluoride in my drinking water against my consent and certainly against my better judgment. I know that I am not alone in this stand, as several other Canadian cities have already tried this "experiment" and have now stopped it, thank goodness. Let us be wise enough not to go down this road in the first place. There is no evidence to support the belief that this course of action strengthens teeth. When ingested, fluoride has the potential to cause all kinds of bodily harm. It is no accident that the labels of fluoridated toothpaste caution against swallowing the stuff when you are using it to brush your teeth.

Please, please, wake up and stop this foolishness before it goes any further!

Thank you.
Kathie Joblin
705-326-7873
kathiejoblin@rogers.com

From: sherrisherri1@hotmail.com [mailto:sherrisherri1@hotmail.com]
Sent: Monday, March 26, 2012 10:36 PM
To: MAYOR EMAIL
Subject: Fluoride

I don't believe we should be contaminating the water, if their is any truth to what people are saying about the fluoride,it could harm us. It is not something i would want to try. I have done some research on this, their is to many risks involved,think about the people.

-----Original Message-----
From: adam duncan [mailto:waymoreadam@rogers.com]
Sent: Tuesday, March 27, 2012 12:50 AM
To: MAYOR EMAIL
Subject: flouride

Please please please
DO NOT ALLOW FLOURIDE IN "OUR" CITY WATER.
I urge you to strongly reconsider this idea.
It may have some merits, but I truly believe the cons strongly outway the pros.
Year round I consume at least 3 litres of water per day. Alot more during the summer.
While i understand that this is likely well above average, I do not believe that I am alone in this range of consumption.
Anyone who works outdoors can attest...
My concern is that due to the possible side affects and cancer risks I will no longer be able to fill my gallon thermos with tap water every morning.
Why should I buy bottled water if I have already paid taxes for tap water.
Dehydration vs. Cancer.
Which one would you choose.

-----Original Message-----
From: Megan [mailto:jack_skellington9122@hotmail.com]
Sent: Tuesday, March 27, 2012 7:27 AM
To: MAYOR EMAIL
Subject: floride

to who ever it may concern.
hello i am a citizen of orillia and iam outraged that any one could even possibly think of dumping floride.into our water. they say its to help stop childrens teeth from decaying but let me tell you this... if you are any kind of good parent then guess what? you will see to it that your child takes care of their teeth. if your a parent that votes yes for floride then you are just lazy and should not have had children in my opinion.
from the facts i have read about floride we would be stupid to let it make its way into our water. we have rights and i dont want anything to do with floride.
its said that it is illegal to dump into the ocean...well guess what if we put it into our water no matter what it will make its way to the ocean. all floride is is a toxic by product and i vote NO!

thank you for taking your time to read this yours truely Megan Adams

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From: Rosemary Calverley [mailto:rosemarycalverley@hotmail.com]
Sent: Tuesday, March 27, 2012 9:38 AM
To: MAYOR EMAIL; Andrew Hill; Tony Madden
Subject: Fluoride in Orillia water

I am both shocked and disappointed that at this point in time, when there is so much information about the detrimental side effects of consuming fluoride, that Orillia would even be considering fluoridating our tap water.

Has anyone done the research? It doesn't seem to me that they have or no one would be on side with this, especially if you have children.

Fluoride works to strengthen and protect teeth when applied topically. To date, there are no studies that show any improvement in protection from consuming it. In fact quite the opposite is true. Ingested fluoride has been linked to over a dozen serious health problems including reduced IQ (25 published studies), impaired neurobehavioral development, and brain damage (over 100 published studies). Parents who use tap water to mix baby formula need to be warned that they will be exposing their children to 175 times more fluoride than breast fed children.

The fluoride added to drinking water supplies is a waste product from the phosphate fertilizer industry. Fluoride is a drug. Once added to water the amount consumed cannot be controlled. It violates my rights to informed consent if it is in my tap water.

Communities all across Canada are voting to discontinue the fluoridation of their water. B.C. and Quebec are almost completely fluoride free, Waterloo voted to end fluoridation in Oct 2010, Calgary counsel has voted against it as well.

Please check Dr. Paul Connett (You Tube "Your Toxic Tap Water" or his book, "The Case Against Fluoride"). Also The National Research Counsels published work "Fluoride in Drinking Water".

Look on the back of your tube of fluoridated toothpaste which says "use a pea sized amount" and "if ingested contact a poison control center".

Tony Madden
I am very disappointed in your continued support of the West St. site for the Murf, and your support of Fluoride. My brother in law has worked in the waste disposal industry for many years. Contaminated land remains contaminated for decades. Contamination seeps into everything, including the cement of an in ground pool and therefore, the water. I would not let my children use a recreation facility on the West Street site. I will not vote for you again and am, frankly, embarrassed that you represent my district. Do you actually research the topics that you support or do you just follow a lead?

Rosemary Calverley

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Tuesday, March 27, 2012 12:43 PM
To: JASON COVEY
Subject: Water Fluoridation - Public Record

Hello Jason,

Please include the following in the Public Record. Thank you.
Colleen

<u>Decision Making</u>

The following information may be useful to Council in its decision-making with regard to Water Fluoridation.

The International Joint Commission (IJC), in its Eighth Biennial Report, recommends to all levels of Government, including Municipal Government, four basic principles to use in decision-making. The IJC is the monitoring body of the ***Great Lakes Water Quality Agreement of 1978*** between Canada and the United States "to restore and maintain the chemical, physical, and biological integrity of the Great Lakes Basin Ecosystem". (p.7)

The four principles are:

1) **Precaution** - make decisions on the side of caution
2) **Prevention** - prevent further pollution of Lake Simcoe
3) **Weight of Evidence** - what do peer reviewed, published, scientific studies indicate?
4) **Reverse Onus of Proof** - Those who wish to discharge fluorosilicic acid into the Lake Simcoe must prove that it is harmless.

From: dianne orton [mailto:diniii@distributel.net]
Sent: Tuesday, March 27, 2012 5:18 PM
To: Michael Fogarty; Andrew Hill; Paul Spears; Linda Murray; Patrick Kehoe; Tony Madden; Pete Bowen
Cc: Jason Covey
Subject: Fw: Fluoride News 2-28-2012]

Dear City Councilors & Jason:

******Jason: I would like you to enter this information as part of the Public Record ******

Do you think the "HEALTHY SMILES PROGRAM" will work like this? If the Simcoe County Health Dept and Canadian Dental Association truly cared, they would inform, teach and provide the proper measures to protect the childrens teeth. **FLUORIDATION IS NOT THE ANSWER!**

Pew Study: ER dental treatment visits up
CHICAGO (AP) – More Americans are turning to the emergency room for routine dental problems – a choice that often costs 10 times more than preventive care and offers far fewer treatment options than a dentist's office, according to an analysis of government data and dental research.

The number of ER visits nationwide for dental problems increased 16 percent from 2006 to 2009, and the report released today by the Pew Center on the States suggests the trend is continuing.

In Florida, [78% fluoridated] for example, there were more than 115,000 ER dental visits in 2010, resulting in more than $88 million in charges. That included more than 40,000 Medicaid patients, a 40 percent increase from 2008. In Florida, only about 10 percent of dentists participate in the state Medicaid program, he said.

Many ER dental visits involve the same patients seeking additional care. In Minnesota, nearly 20 percent of all dental-related ER visits are return trips, the analysis said.

Emergency rooms are really the canary in the coal mine. If people are showing up in the ER for dental care, then we've got big holes in the delivery of care," said Shelly Gehshan, director of Pew's children's dental campaign. "It's just like pouring money down a hole.

In 2009 alone:

- Fifty-six percent of Medicaid-enrolled children nationwide received no dental care.

- South Carolina [95% fluoridated] ER visits for dental-related problems increased nearly 60 percent from four years earlier.

-Tennessee [was 99% fluoridated] hospitals had more than 55,000 dental-related ER visits – five times as many as for burns.

The numbers also are rising in hospitals in Illinois [where fluoridation is state-mandated]
She said the Pew center is working with states to develop training for dental hygienists and other non-dentists in treating cavities and other uncomplicated procedures. Other potential steps include increasing water fluoridation and use of dental sealants.

http://www.saukvalley.com/2012/02/27/er-dental-treatment-visits-up/ajqp738/

Link to whole report:
http://www.pewcenteronthestates.org/report_detail.aspx?id=85899372244 and

http://www.pewcenteronthestates.org/uploadedFiles/A%20Costly%20Dental%20Destination.pdf

Additional info from Wall Street Journal

— In Florida, ER visits for dental trouble totaled more than 115,000 in 2010, resulting in more than $88 million in charges. That included more than 40,000 Medicaid patients, a 40 percent increase from 2008.

— Dental visits to the ER by Oregon Medicaid patients totaled 12,402 in 2010, a 31 percent jump from 2008.

— South Carolina ER dental visits increased nearly 60 percent in 2009 from four years earlier.

— Tennessee ER dental visits totaled more than 55,000 in 2009 — five times more than for burns.

— Dental visits to North Carolina emergency rooms totaled more than 69,000 in 2009 — the 10th most common reason for ER treatment in the state.

— Georgia's 60,000 ER visits for dental problems and oral health in 2007 cost more than $23 million.

— In New York, ER or surgery center treatment for tooth decay-related trouble in young children cost more than $31 million in 2008, 32 percent higher than in 2004.

— In Illinois' Cook County, including Chicago, ER dental visits totaled nearly 77,000 from 2008 to 2011.

— In Maine, dental problems were the main reason for ER visits among Medicaid patients and uninsured young people in 2006.

http://online.wsj.com/article/APb7290d7399674e05b7e84dbc6874ecb0.html

Study: Medicaid doesn't improve dental care access

Conclusions: This USA population-based study found disparities exist within Medicaid's services between utilization of dental and medical services. Medicaid insurance improved utilization of

medical services, but did not improve the utilization of dental services. This suggests that Medicaid insurance does not improve access to dental services for poor children.

Dentists: Are You Tired of the Fluoridated Water Debate?

February 28, 2012 By Catherine Hughes Leave a Comment

Are you for or against fluoridated water?

http://www.thewealthydentist.com/blog/2664/dentists-are-you-tired-of-the-fluoridated-water-debate/

NEW JERSEY

TAKE ACTION Against The NJ Fluoridation Bill! - Home - Gary Null - Your Guide To Natural Living

February 27, 2012

1.) If you are a NJ resident and would like participate in the fight against fluoridation, contact FAN's state coordinator, and visit No Fluoride New Jersey.

2.) Call the offices of the Senate President and Speaker of the House. Tell them not to ignore Assembly rules, the $5 billion dollar price tag, or the health risks associated with fluoridation:

Here are the top people to call:

Senate Majority leader Loretta Weinberg (201) 928-0100
She signed on as a primary sponsor of the bill S959

Senate President Steve Sweeney (856) 251-9801
He promptly scheduled the final vote

Assembly Majority leader Louis Greenwald (856) 435-1247
He signed on as a primary sponsor of the bill A1811

Assembly Speaker Sheila Oliver (973) 395-1166
She scheduled the final vote without having the Appropriations committee hold a hearing

Democrats have a majority in both the Senate and the Assembly. They can pass this without any Republican votes. In the Senate Health Committee hearing, the three Republicans who stayed for the entire hearing did not vote for the bill. One voted NO and the other 2 ABSTAINED. (Wow, they actually listened.)

At a Governor's town hall meeting in Westfield, vaccine choice activist (Sue Collins) asker Christie about fluoridation. Christie expressed skepticism about it. He may be our best shot at stopping this travesty. We should call him to encourage him to veto this bill if the Democrats ram it through.

Governor Chris Christie 609-292-6000

http://www.garynull.com/home/take-action-against-the-nj-fluoridation-bill.html

Poor kids drink too much juice

More than a third of parents surveyed, and about half of parents with a yearly household income of less than $30,000, reported their 1- to 5-year-olds drink two or more cups of juice on a typical day.

That's twice the amount recommended by the American Academy of Pediatrics (AAP), which advices kids under age 6 drink just one serving of juice per day.

Too much juice puts kids at risk for health conditions such as childhood obesity and early tooth decay, the researchers said. Both of these conditions are more prevalent in low-income children.

http://www.livescience.com/18686-children-juice-consumption-childhood-obesity.html
New York State Coalition Opposed to Fluoridation, Inc (NYSCOF)
NYSCOF News Releases
Follow NYSCOF on Twitter or Facebook
Fluoride Action Network
Fluoride Journal
Canadians Opposed to Fluoridation

*** PLEASE NOTE MY EMAIL HAS CHANGED TO diane.sprules@cogeco.ca

Diane Sprules
905-842-2540
diane.sprules@cogeco.ca

From: Kathryn Johnstone [mailto:yogabykathryn@gmail.com]
Sent: Tuesday, March 27, 2012 9:36 PM
To: JASON COVEY
Subject: Fwd: Comments from Council in Amherstburg - Fluoride

Hello Jason,

I am please asking you to recommend against fluoride going into our water.
I have my personal reasons for not wanting the fluoride in our water. It has made me do a lot of research to verify why I don't want it added.
I have also decided to contact other locations that have had fluoride on their agenda. I am hoping that having comments from other Counselors will be another opportunity for you to consider recommending no to fluoride.
Please see below my letter to the Council in Amherstburg and the responses I received.
I have also forwarded these emails on to all Councilors.
Thank you for your time and consideration in the matter.
Sincerely
Kathryn Johnstone
705-326-8273

Dear Amherstburg City Council:
I am a resident of Orillia, Ontario. My City Council is in the process of deciding whether or not to fluoridate our water. You voted unanimously to discontinue this practice in your community. Would you, please, let me know why you decided to end this practice. I would like to present this information to my City Council for its consideration.
It would be very much appreciated if you would send me a letter with a group statement on the reasons for keeping the fluoride out. I will be passing this on to our Council and those in charge of making recommendations.
Thank you, so much, for your time and attention. You will be doing our community a great service.

Sincerely,
Kathryn Johnstone
yogabykathryn@gmail.com
705-326-8273

Hi Kathryn,

The bottom line is that there is no definitive study that shows there is any deleterious effect to removing fluoride from our water and many that suggest there can be long term effects of fluoridation. Both Amherstburg and Windsor (which serves Tecumseh and Lasalle as well) have agreed to a moratorium where we can study the issue further before deciding on whether to re-establish the practice of fluoridation. Personally I don't foresee that happening.

Best regards,

John

John Sutton
Councillor
Town of Amherstburg
271 Sandwich St. South
Amherstburg, Ontario, N9V 2A5
Tel: Home: 519-736-1435, Cell: 519-796-7492
TTY:519-736-9860
Fax: 519-736-5403 (Town Hall)
Email: jsutton@amherstburg.ca
http://www.amherstburg.ca

Hello Kathryn,

Here is the information that our Council received regarding their decision to put a moratorium on fluoridation of Amherstburg's water supply, I have also copied you on the motion that was passed by our Council and some delegations that were heard that night……hope this helps!

DELEGATIONS

8.1 Artificial Water Fluoridation
- Kimberly DeYong
- Heather Gingerich, International Medical Geology Association
- Lorene Clayton
- Pat Andrews
- Christine Moody

The aforementioned individuals addressed Council with regard to their concerns of the inclusion of fluoridation in the Town's water supply.

Councillor Davies moved, Councillor Pillon seconded:

That the delegations be received.

The Mayor put the Motion.
Motion Carried

The Mayor noted that Council may wish to consider Councillor Davies Notice of Motion listed later on the agenda for consideration with the delegations.

Councillor Davies moved, Councillor Pouget seconded:

That a moratorium be put on future purchase and installation of new municipal water fluoridation equipment and further purchase and use of fluoridation chemical known as hydrofluorosilicic acid (H2SiF6) containing silicofluoride;
And further that Administration be directed to request the government jurisdictions including Health Canada, the Ontario Ministries of Labour and Environment, evidence ensuring that the Town employees and any others working with the hydrofluorosilicic acid process are not put in harm's way, as required by the Ontario Health and Safety Act (1990).

The Mayor put the Motion.
Motion Carried Unanimously

Paula Parker
Deputy Clerk
Town of Amherstburg
271 Sandwich St South
Amherstburg, Ontario, N9V 2A5
Tel: 519-736-0012 ext 238
TTY:519-736-9860
Fax: (519)736-5403
Email: pparker@amherstburg.ca
http://www.amherstburg.ca
Click here for the Amherstburg Activity Guide.

From: Linda [mailto:lupper2@rogers.com]
Sent: Tuesday, March 27, 2012 10:05 PM
To: MAYOR EMAIL; Michael Fogarty; Paul Spears
Cc: JASON COVEY; orilliacitizensagainstfluoride@gmail.com
Subject: Water Fluoridation

To Mayor Orsi, Counsellor Fogarty and Counsellor Spears,

I, Linda Upper, ask you as the Mayor and Counsellors of the City of Orillia, to vote NO on my behalf on the issue of fluoridating Orillia's drinking water. I do not want the toxic waste known as hydrofluorosilicic acid added to my drinking water. I feel this would be an invasion on my right to clean drinking water. My husband and I moved to Orillia from Niagara Falls two years ago to be able to enjoy clean, fresh air and clean, fresh water. If hydrofluorosilicic acid is voted in and added to the drinking water, my husband and I will move out of Orillia to another place that is fluoride-free. Please, vote NO to adding fluoride to our water.

Sincerely,
Mrs. Linda Upper.
46-337 West St. N,
Orillia, ON
705-259-1096

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Tuesday, March 27, 2012 10:42 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; Charles Gardner; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Subject: FW: FLUORIDE IN FOODS!

I request that the attached document be and this e-mail be entered into the public record for the fluoridation issue.

Please not that there are MANY foods and beverages with A LOT OF FLUORIDE in them!
The levels were a shock to me.
I have stopped drinking tea and have eliminated many other items from my diet as a result of examining this data carefully.

Please be aware that adding fluoride to the city water will further add to the intake of harmful fluoride. I understand that there is NO biological function that requires or tolerates fluoride, let alone the toxic waste known as HEXAFLUOROSILICIC ACID.

I request that you vote NO to fluoridation.

May I also point out that your elected mandate does not include introducing a toxic substance in the water such as fluoride, or the ability to dispose of 70 forty-five US gallons of this toxic waste product into our lakes and rivers. In order to proceed with this, you owe it to the people to at least take a proper vote - this would then leave you "Off the hook", so to speak.

Steve Goulter

USDA National Fluoride Database of Selected Beverages and Foods

Prepared by

Nutrient Data Laboratory
Beltsville Human Nutrition Research Center
Agricultural Research Service
U.S. Department of Agriculture

in collaboration with

University of Minnesota, Nutrition Coordinating Center (NCC)

University of Iowa, College of Dentistry

Virginia Polytechnic Institute and State University, Food Analysis Laboratory Control Center

National Agricultural Statistics Service (NASS), CSREES, USDA and

Food Composition Laboratory (FCL), Beltsville Human Nutrition Research Center
Agricultural Research Service, U.S. Department of Agriculture

October 2004

U.S. Department of Agriculture
Agricultural Research Service
Beltsville Human Nutrition Research Center
Nutrient Data Laboratory
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Building 005, Room 107, BARC-West
Beltsville, Maryland 20705
Tel. 301-504-0630, FAX: 301-504-0632
E-Mail: ndlinfo@rbhnrc.usda.gov
Web site: http://www/nal/usda/gov/fnic/foodcomp

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Acknowledgements

This study was conducted as part of an Interagency Agreement between the U.S. Department of Agriculture, Nutrient Data Laboratory and The National Institute of Dental & Craniofacial Research and the National Heart, Lung, and Blood Institute of the National Institutes of Health, NIH Agreement No. Y3-HV-8839

The authors wish to thank Dr. Nancy Miller-Ihli, FCL, USDA for her work on pilot studies with drinking water and brewed tea, and development of NFDIAS quality control materials. The authors also wish to thank the 144 participants nationwide who supplied residential drinking water samples for this study.

Disclaimers

Mention of tradenames, commercial products, or companies in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture over others not mentioned.

Documentation: USDA National Fluoride Database of Selected Beverages and Foods

Introduction

Assessment of fluoride intake is paramount in understanding the mechanisms of fluoride metabolism specifically the prevention of dental caries, dental fluorosis, and skeletal fluorosis. The Institute of Medicine (IOM, 1997) specified Adequate Intakes (AI) of 0.01 mg/day for infants through 6 months, 0.05 mg/kg/day beyond 6 months of age, and 3 mg/day and 4 mg/day for adult women and men (respectively), to prevent dental caries. Upper limits (UL) of 0.10 mg/kg/day in children less than 8 years and 10 mg/day for those older than 8 years are recommended for prevention of dental fluorosis. Similar levels have been endorsed by the American Dental Association (ADA, 1994) and the American Dietetic Association (ADA, 2000). Fluoride works primarily via topical mechanisms to inhibit demineralization, to enhance remineralization, and to inhibit bacteria associated with tooth decay (Featherstone, 2000). Fluoride has an affinity for calcified tissues. Studies of exposure and bone mineral density, fractures and osteoporosis would benefit from a national fluoride database coupled with an intake assessment tool (Phipps, 1995; Phipps *et al.,* 2000). Therefore, a database for fluoride is needed for epidemiologists and health researchers to estimate the intakes and to investigate the relationships between intakes and human health.

The Nutrient Data Laboratory (NDL), Agriculture Research Service, US Department of Agriculture (USDA) coordinated the development of this USDA National Fluoride Database of Selected Beverages and Foods subsequently described as the National Fluoride Database--a critical element of the comprehensive multi-center National Fluoride Database and Intake Study (NFDIAS). The National Fluoride Database will be incorporated into a computer-based fluoride assessment tool being developed by the University of Minnesota, Nutrition Coordinating Center (NCC), as a module of the Nutrition Data System for Research (NDS-R) software.

The National Fluoride Database is a comprehensive, nationally representative database of the fluoride concentration in foods and beverages consumed in the United States. It contains fluoride values for beverages, water, and foods that are major fluoride contributors. Water and water-based beverages are the chief source of dietary fluoride intake (Singer and Ophaug, 1984). Conventional estimates are that about 75% of dietary fluoride comes from water and water-based beverages. According to the 1992 Fluoridation Census (CDC, 1993), about 63% of the population on U.S. public water systems are receiving water that is fluoridated naturally or by adding fluoride. Drinking water fluoride distributions may vary widely over geographical and geo-political boundaries (CDC, 1993). Variations occur with soil composition and with local political decisions to fluoridate water. The use of wells of varying depths, commercial water products, home water purifiers, and filtration systems also increase variability of fluoride in drinking water and complicate estimates of intake (Brown and Aaron, 1991; Robinson *et al.*1991; Van Winkle *et al.*, 1995). These variations in fluoride in commercial foods and beverages have been addressed in this National Fluoride Database.

Methods and procedures

Data Generation

The fluoride contents of the chief contributors to fluoride intake have been determined through a national sampling and analytical program developed by NDL under the National Food and Nutrient Analysis Program (NFNAP, Pehrsson *et al*., 2000). In this database, mean values for fluoride in a particular beverage or food come from different data sources. Analytical data for US samples from the scientific literature and unpublished analytical data from Jackson *et al.*, 2002; Kingman, 1984; Levy *et al*., 1992-2003; and Ophaug, 1983-1987 have been included as well as analytical data for 126 items developed specifically for this National Fluoride Database. NDL used the Key Foods approach (Haytowitz *et al.*, 2000) giving consideration to the previously published fluoride data for foods, beverages, and drinking water as well as the respective patterns of consumption of these dietary items to identify and prioritize sampling and analysis of the key food and beverage contributors of dietary fluoride. Consumption data from the 1994-96 USDA Continuing Survey of Food Intakes by Individuals and a preliminary fluoride database developed by the NCC provided the values for the initial evaluation. Mean estimates of fluoride concentration and variability in drinking water, beverages and foods that are the chief contributors to dietary fluoride in the United States have been developed from analysis of representative samplings.

High priority beverages which collectively contribute up to 80% of dietary fluoride consumed in the United States, including municipal (tap)/drinking and bottled waters, teas, carbonated beverages, beers, and ready-to drink juices and drinks were analyzed. Samples were collected according to a self-weighting, nationally representative sampling approach (Bellow *et al*., 2002). Samples were collected in up to 144 locations across the country, depending on the level of contribution to fluoride intake. Since drinking water accounts for approximately 75% of dietary fluoride intake, sampling of drinking water was conducted, with Office of Management and Budget approval, in 144 nationally representative private residential locations nationwide (Pehrsson *et al*., 2004). The distribution of fluoride does vary due to naturally occurring fluoride levels and local fluoridation practices. The use of well water, commercial bottled waters, home purifiers and filter systems also affects variability in fluoride content of drinking water and impacts on estimates of daily intakes for individuals. NDL contacted water suppliers about their fluoridation practices and these were compared to participant responses (Wilger *et al*., 2004). Differences in geographical location have been incorporated into the National Fluoride Database for drinking water, brewed tea, and carbonated sodas.

Retail samples of fruit juices, fruit-flavored beverages, carbonated beverages, bottled water, and a limited number of foods were picked up in 12 to 36 locations. The author's assumption that the fluoride variability would be lower in processed beverages and foods than that of municipal water was made based on existing data and the results of the water pilot study (Miller-Ihli *et al*., 2003), and hence fewer samples.

The procurement and sample preparation of the foods and beverages that are the chief contributors of fluoride were handled through NFNAP supervised contracts and agreements. Sample units were purchased at retail sites, following detailed instruction from NDL. Sample preparation was handled by Virginia Polytechnic Institute and State University, Food Analysis Laboratory Control Center (FALCC). A quality control (QC) oversight program was established by the NFDIAS Laboratory Methods/Quality Control Working Group with representation from NDL, the University of Iowa, and FALCC. NFDIAS quality control materials were prepared by the USDA, Food Composition Laboratory (FCL) and by the NDL and characterized by three cooperating laboratories.

The laboratory analysis of fluoride was conducted by the University of Iowa, College of Dentistry. Samples were analyzed using a fluoride ion-specific electrode direct read method for clear liquids and a micro-diffusion method for other food samples. The direct reading method was validated using Certified Reference Material (National Institute of Standards and Technology (NIST), a Standard Reference Material (SRM) 2671a, Fluoride in Freeze-Dried Urine) and by a comparison of results for several beverage samples between University of Iowa and FCL (Patterson *et al*., 2004). The micro-diffusion method was validated by analysis of a Certified Reference Material (National Research Centre for Certified Reference Materials, Beijing, China, GBW 08572 Prawns) and other reference materials that have reference values for the fluoride content (for example: NIST, SRM 8436), prior to sample analysis. Methodological procedures for analyzing carbonated beverages were developed at the University of Iowa and presented at the March 2004 International Association for Dental Research (IADR) Meeting (Heilman *et al*., 2004).

Values in the database are reported on a 100 g basis, and on the edible portion of a food. For some foods, no standard error was available from the literature source. Much of the literature data as well as the analytical data reported by the University of Iowa were reported on a fluid (ppm) basis. Specific gravities needed for fluoride data conversion and migrations were obtained from VPI. Specific gravities for literature data were based on the specific gravities obtained from VPI, from other sources (manufacturer), or were determined by NDL. Values for beverages other than water, coffee and tea were adjusted by their respective specific gravities and are reported as served.

Fluoride analytical results were submitted to the NFDIAS Quality Control (QC) Panel for review. These data included beer, wine, drinking water, brewed tea (considered significant contributors to total intake of fluoride) and miscellaneous lower priority foods. The fluoride value for unsweetened instant tea powder seems high when reported at 89,772 mcgs/100 grams because this product is extremely concentrated. However when one teaspoon of the unsweetened tea powder weighing 0.7 g is added to an eight ounce cup of tap water, the value for prepared instant tea is 335 mcg/100 g. This prepared unsweetened instant tea value compares well with the analytical values reported for regular brewed tea.

Data evaluation

Analytical data approved by the NFDIAS QC panel, unpublished data generated by the University of Iowa, and data gathered from the published literature by NCC and NDL were entered into the USDA National Nutrient Databank System (NDBS) for further evaluation and compilation. The data were evaluated for quality using procedures developed by scientists at the NDL as part of the Nutrient Databank System (Holden, *et al*., 2002). These procedures were based on categories and criteria described earlier by Holden, *et al*. 1987 and Mangels, *et al*. 1993 with some modifications. Categories evaluated include: sampling plan, sample handling, number of samples, analytical method and analytical quality control. The evaluation process was modified making it specific to fluoride analytical methods. Evaluation of the analytical method has two facets: the method itself (processing of samples, analysis and quantitation method) and validation and quality control of the method by the laboratory (accuracy and precision). Both the NFNAP analytical data and data from each manuscript were evaluated for each category, which then received a rating ranging from 0 to 20 points. The ratings for each of the five categories were summed to yield a Quality Index or QI-the maximum possible score is 100 points. The Confidence Code (CC) was derived from the QI and is an indicator of relative quality of the data and the reliability of a given mean. The CC is assigned as follows:

QI	CC
75-100	A
74-50	B
49-25	C
< 25	D

Format of the table

The table contains fluoride values for 400 foods across 23 food groups. The data were aggregated where possible to match the foods in the USDA National Nutrient Database for Standard Reference (SR). Food groups are presented in alphabetical order with beverages and foods arranged in alphabetical order within a food group. Whenever possible, a NDB Number (No.) (a five digit numerical code used in the SR) is provided. This NDB No. provides the link between values for foods in this database and SR. As the data come from a variety of sources or are presented with specificity not used in SR, there are a number of beverages and foods which are included without a NDB No. In these cases, we assigned a temporary NDB No. which begins with “975.” These temporary NDB Nos. are not unique to these beverages and foods and may be used in other special interest databases produced by NDL.

The fields are as follows:

Field Name	Description
Food Group	Description of food group
Item	Description of food or beverage
Mean	Amount in 100 grams, edible portion
Std Error	Standard error of the mean. Null, if could not be calculated
N	Number of data points (samples analyzed). The N=1 on NFNAP data represents a composite of 12 samples
Min	Minimum value
Max	Maximum value
Lower EB	Lower 95% error bound
Upper EB	Upper 95% error bound
CC	Confidence code indicating data quality based on evaluations of sample plan, sample handling, analytical method, analytical quality control, and number of samples analyzed
Derivation Code	Code giving specific information on how the value was determined: A = Analytical data RPA = Recipe; Known formulation; No adjustments applied, combination of source codes 1, 12 and/or 6 RPI = Recipe; Known formulation; No adjustments applied, combination of source codes which includes codes other than 1, 12 or 6
Source Code	Code indicating type of data 1 = Analytical or derived from analytical 6 = Aggregated data involving combinations of source codes 1 & 12 12 = Manufacturer's analytical; partial documentation
Statistical Comments	1. The displayed summary statistics were computed from data containing some less-than values. Less-than, trace, and not detected values were calculated 2. The displayed degrees of freedom were computed using Satterthwaite's approximation (Korz and Johnson, 1988) 3. The procedure used to estimate the reliability of the generic mean requires that the data associated with each study be a simple random sample from all the products associated with the given data source (for example, manufacturer, variety, cultivar, and species) 4. For this nutrient, one or more data sources had only

	one observation. Therefore, the standard errors, degrees of freedom and error bounds were computed from the between-group standard deviation of the weighted groups having only one study observation.
NDB No.	5-Digit Nutrient Databank number that uniquely identifies a food item. In a number of cases, where the descriptions provided in the literature were not as specific as those in SR, we have provided multiple NDB numbers, for which the fluoride values are also applicable.
No. of Studies	Number of studies
References	Unique descriptions of the references/sources

Data dissemination

The USDA National Fluoride Database of Selected Beverages and Foods is presented as a pdf file. The Adobe Reader® is needed to view the report of the database. A Microsoft Excel spreadsheet is also available (fluoride.xls). The user can download the database, free of charge, from NDL's web site (http://www.nal.usda.gov/fnic/foodcomp) onto his/her own computer for use with other programs.

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Food Group	Item	Mean mcg/100g **	Std Error	Num datapts	Min Value	Max Value	Lower 95% EB	Upper 95% EB	Confidence Code	Derv. Code	Source Code	Statistical Comments	NDB No.	No. of Studies	References
Baby Foods:															
	Cereal, mixed, with applesauce and bananas, junior	1	0.1	3	1	1			C	A	1		03188	1	Levy 1992-2003
	Cereal, oatmeal, with applesauce and bananas, junior	8		2	2	14			C	A	1		03192	1	Levy 1992-2003
	Cereal, rice, with applesauce and bananas, strained	16		2	2	31			C	A	1		03195	1	Levy 1992-2003
	Cereal, rice, with mixed fruit, junior	3		1	3	3			C	A	1		03210	1	Levy 1992-2003
	Dessert, custard pudding, vanilla, junior	4		2	4	4			C	A	1		03246	1	Levy 1992-2003
	Dessert, dutch apple, junior	2	0.3	3	1	2	0	3	C	A	1		03221	1	Levy 1992-2003
	Dessert, fruit dessert, junior	18	9.7	5	2	45	0	45	C	A	1		03236	1	Levy 1992-2003
	Dessert, peach cobbler, junior	8	6.4	4	2	28	0	48	C	A	1		03228	1	Levy 1992-2003
	Dinner, chicken noodle, junior	29	9.8	5	11	60			C	A	1		03069	1	Levy 1992-2003
	Dinner, macaroni and cheese, junior	6		2	5	7			C	A	1		03090	1	Levy 1992-2003
	Dinner, spaghetti, tomato, meat, junior	2		1	2	2			C	A	1		03050	1	Levy 1992-2003
	Dinner, turkey and rice, junior	20	8.7	4	9	46	6	16	C	A	1		03083	1	Levy 1992-2003
	Dinner, vegetables and beef, junior	21	11.4	4	2	45	0	57	C	A	1		03054	1	Levy 1992-2003
	Dinner, vegetables and ham, junior	14	9.6	4	0	42	0	44	C	A	1		03062	1	Levy 1992-2003
	Dinner, vegetables and turkey, junior	8	2.6	3	5	13	0	19	C	A	1		03085	1	Levy 1992-2003
	Fruit, apple and blueberry, junior	1		2	1	2			C	A	1		03165	1	Levy 1992-2003
	Fruit, applesauce, junior	2	1.4	3	1	5	0	8	C	A	1		03117	1	Levy 1992-2003
	Fruit, applesauce, strained	1		2	1	1			C	A	1		03116	1	Levy 1992-2003
	Fruit, apricot with tapioca, junior	0		1	0	0			C	A	1		03128	1	Levy 1992-2003
	Fruit, bananas, pineapple with tapioca, junior	16		2	2	29			C	A	1		03156	1	Levy 1992-2003
	Fruit, bananas with tapioca, junior	36		2	33	40			C	A	1		03280	1	Levy 1992-2003
	Fruit, mango with tapioca, strained	12		1	12	12			C	A	1		03140	1	Levy 1992-2003
	Fruit, peaches with sugar, strained	0		2	0	1			C	A	1		03130	1	Levy 1992-2003
	Fruit, peaches, junior	3	1.2	4	1	6	0	6	C	A	1		03131	1	Levy 1992-2003
	Fruit, pears and pineapple, junior	1		2	1	2			C	A	1		03159	1	Levy 1992-2003
	Fruit, pears, junior	9	4.7	4	0	17	0	29	C	A	1		03133	1	Levy 1992-2003
	Fruit, pears, strained	1		2	1	1			C	A	1		03132	1	Levy 1992-2003
	Fruit, plums with tapioca, junior	34		2	20	49			C	A	1		03135	1	Levy 1992-2003
	Fruit, prunes, without Vitamin C, strained	2		2	2	2			C	A	1		03139	1	Levy 1992-2003
	Juice, apple	12	2.9	6	5	22	0	55	C	A	1		03166	1	Levy 1992-2003
	Juice, apple and cherry	67	16.1	8	11	133	0	170	B	A	1		03268	1	Levy 1992-2003
	Juice, apple and grape	45	13.1	4	27	83	0	122	C	A	1		03265	1	Levy 1992-2003
	Juice, apple and peach	19	9.4	8	4	69			B	A	1		03168	1	Levy 1992-2003
	Juice, apple and prune	13		2	12	14			C	A	1		03171	1	Levy 1992-2003
	Juice, apple-cranberry	10		1	10	10			C	A	1		03169	1	Levy 1992-2003
	Meat, beef, junior	2	1.0	3	0	3	0	6	C	A	1		03003	1	Levy 1992-2003
	Meat, ham, junior	3		2	1	5			C	A	1		03009	1	Levy 1992-2003
	Meat, lamb, junior	10		2	5	14			C	A	1		03011	1	Levy 1992-2003
	Meat, turkey, junior	44		2	21	66			C	A	1		03016	1	Levy 1992-2003
	Vegetables and bacon, junior	3		1	3	3			C	A	1		03060	1	Levy 1992-2003
	Vegetables, carrots, strained	1		2	1	1			C	A	1		03099	1	Levy 1992-2003
	Vegetables, carrots, junior	12	6.9	5	1	35	0	31	C	A	1		03100	1	Levy 1992-2003
	Vegetables, corn, creamed, junior	32		2	32	32			C	A	1		03120	1	Levy 1992-2003
	Vegetables, green beans, junior	12	3.1	5	4	21	0	17	C	A	1		03092	1	Levy 1992-2003
	Vegetables, green beans, strained	16		2	15	16			C	A	1		03091	1	Levy 1992-2003
	Vegetables, peas, strained	25		2	23	28			C	A	1		03121	1	Levy 1992-2003
	Vegetables, squash, junior	5	2.2	4	1	11	0	12	C	A	1		03105	1	Levy 1992-2003
	Vegetables, squash, strained	1		2	1	1			C	A	1		03104	1	Levy 1992-2003
	Vgetables, sweetpotatoes, junior	10	4.0	5	1	22	0	39	C	A	1		03109	1	Levy 1992-2003
	Vegetables, sweetpotatoes, strained	1		2	1	1			C	A	1		03108	1	Levy 1992-2003

Food Group	Item	Mean mcg/100g **	Std Error	Num datapts	Min Value	Max Value	Lower 95% EB	Upper 95% EB	Confidence Code	Derv. Code	Source Code	Statistical Comments	NDB No.	No. of Studies	References
Baked products:															
	Biscuits, refrigerated dough, baked	26		9					C	A	1		18013 18015	1	Ophaug 1983-1987
	Bread, all (white and whole wheat)	39	4.6	34	11	57	29	49	C	A	1	4	18069 18075	4	Featherstone 1988 Kingman 1984 Ophaug 1983-1987 Taves 1983
	Bread, rye	51		9					C	A	1		18060	1	Ophaug 1983-1987
	Bread stuffing, prepared, baked	51		2					D	A	1	4	18082	1	Taves 1983
	Brownie, with nuts	38		2	33.3	43.1			D	A	1	4	97500	1	Jackson 2002
	Cake, all	22	1.9	29	18	26	16	28	C	A	1	4	97501	2	Ophaug 1983-1987 Taves 1983
	Cookies, without raisins, all	16	2.1	42	5	29	12	21	C	A	1	4	97502	5	Adair 1991 Featherstone 1988 Kingman 1984 Ophaug 1983-1987 Taves 1983
	Cookies, oatmeal raisin	69		2					D	A	1		18184	1	Kingman 1984
	Cornbread	11		9					C	A	1		18023	1	Ophaug 1983-1987
	Crackers, all	24	4.0	27	9	38	14	33	C	A	1	4	97503	4	Featherstone 1988 Kingman 1984 Ophaug 1983-1987 Taves 1983
	Doughnuts	30	4.5	11					C	A	1	4	97504	2	Kingman 1984 Ophaug 1983-1987
	Éclair, chocolate	13		2					D	A	1		18257	1	Taves 1983
	Muffin, blueberry	39		9					C	A	1		18274	1	Ophaug 1983-1987
	Pancakes, buttermilk, frozen	20		1					C	A	1		18288	1	NFNAP
	Pie, apple, frozen, heated	13		9					C	A	1		18301	1	Ophaug 1983-1987
	Pie, pumpkin, frozen, heated	32		9					C	A	1		18326	1	Ophaug 1983-1987
	Rolls, hamburger and hot dog	25		3	23	30			C	A	1	2 3	18350	1	NFNAP
	Snack type, cake roll	49		2	47	51			D	A	1	4	97505	1	Jackson 2002
	Snack type, chocolate cup cake, cream filled	38		2	37	40			D	A	1	4	97506	1	Jackson 2002
	Snack type, oatmeal cream pie	41		2	33	48			D	A	1	4	97507	1	Jackson 2002
	Tortillas, flour	33		1					C	A	1		18364	1	NFNAP
	Waffles, frozen, KELLOGG'S EGGO	35	11.0	3	23	57	0	83	D	A	1	4	18505	1	Jackson 2002
Beef products:															
	Beef, cooked and raw	22	5.2	57	4	72	11	34	C	A	1	4	97508	4	Featherstone 1988 Kingman 1984 Ophaug 1983-1987 Taves 1983
	Beef, liver, pan cooked with added fat	5		9					C	A	1		13327	1	Ophaug 1983-1987
Beverages:															
	Alcoholic beverage, beer, light	45	2.3	142	7	92	41	50	A	A	1	2 3	14006	1	NFNAP
	Alcoholic beverage, beer, regular	44	2.5	102	6	80	39	49	A	A	1	2 3	14003	1	NFNAP
	Alcoholic beverage, distilled, all (gin, rum, vodka, whiskey), 80 proof	9		9					C	A	1		14037 14050 14051	1	Ophaug 1983-1987
	Alcoholic beverage, wine, red	105	3.3	14	86	119	98	112	A	A	1	2 3	14096	1	NFNAP
	Alcoholic beverage, wine, white	202	6.3	17	152	239	189	215	A	A	1	2 3	14106	1	NFNAP
	Carbonated, cola, diet, fast food type, without ice	78		2	67	89			C	A	1	2 3	97509	1	NFNAP
	Carbonated, cola, fast food type, without ice	65		2	58	72			C	A	1	2 3	97510	1	NFNAP
	Carbonated, cola, PEPSI, all regions	32	2.9	70	1	90	26	38	A	A	1	2 3	97511	1	NFNAP
	Carbonated, cola, PEPSI, Mid-West	36	6.9	16	2	90	22	51	A	A	1	2 3	97512	1	NFNAP

Food Group	Item	Mean mcg/100g **	Std Error	Num datapts	Min Value	Max Value	Lower 95% EB	Upper 95% EB	Confidence Code	Derv. Code	Source Code	Statistical Comments	NDB No.	No. of Studies	References
	Carbonated, cola, PEPSI, Northeast	27	7.0	14	5	74	11	42	A	A	1	2 3	97513	1	NFNAP
	Carbonated, cola, PEPSI, South	45	3.9	24	5	65	37	53	A	A	1	2 3	97514	1	NFNAP
	Carbonated, cola, PEPSI, West	13	2.1	16	1	32	8	17	A	A	1	2 3	97515	1	NFNAP
	Carbonated, cola, COCA-COLA, all regions	49	2.7	72	5	83	44	54	A	A	1	2 3	97516	1	NFNAP
	Carbonated, cola, COCA-COLA, Mid-West	46	5.7	16	9	79	34	58	A	A	1	2 3	97517	1	NFNAP
	Carbonated, cola, COCA-COLA, Northeast	53	7.3	14	5	83	39	69	A	A	1	2 3	97518	1	NFNAP
	Carbonated, cola, COCA-COLA, South	57	2.8	26	20	77	51	63	A	A	1	2 3	97519	1	NFNAP
	Carbonated, cola, COCA-COLA, West	36	6.6	16	11	82	22	50	A	A	1	2 3	97520	1	NFNAP
	Carbonated, cola, DIET PEPSI, all regions	48	4.0	70	5	121	39	56	A	A	1	2 3	97521	1	NFNAP
	Carbonated, cola, DIET PEPSI, Mid-West	46	9.2	16	7	121	26	65	A	A	1	2 3	97522	1	NFNAP
	Carbonated, cola, DIET PEPSI, Northeast	46	11.0	14	7	107	22	70	A	A	1	2 3	97523	1	NFNAP
	Carbonated, cola, DIET PEPSI, South	66	5.1	24	9	104	55	77	A	A	1	2 3	97524	1	NFNAP
	Carbonated, cola, DIET PEPSI, West	25	4.6	16	5	78	15	35	A	A	1	2 3	97525	1	NFNAP
	Carbonated, cola, DIET COKE, all regions	60	5.2	36	1	99	49	71	A	A	1	2 3	97526	1	NFNAP
	Carbonated, cola, DIET COKE, Mid-West	69	9.9	8	10	99	45	92	A	A	1	2 3	97527	1	NFNAP
	Carbonated, cola, DIET COKE, Northeast	58	14.7	7	1	96	22	93	A	A	1	2 3	97528	1	NFNAP
	Carbonated, cola, DIET COKE, South	72	5.0	13	32	91	61	83	A	A	1	2 3	97529	1	NFNAP
	Carbonated, cola, DIET COKE, West	33	11.4	8	8	97	6	60	A	A	1	2 3	97530	1	NFNAP
	Carbonated, cola, PEPSI ONE, all regions	40	5.4	34	0	87	29	51	A	A	1	2 3	97531	1	NFNAP
	Carbonated, cola, PEPSI ONE, Mid-West	47	11.2	8	0	80	21	74	A	A	1	2 3	97532	1	NFNAP
	Carbonated, cola, PEPSI ONE, Northeast	31	13.0	7	2	87	0	63	A	A	1	2 3	97533	1	NFNAP
	Carbonated, cola, PEPSI ONE, South	56	9.1	11	0	82	36	77	A	A	1	2 3	97534	1	NFNAP
	Carbonated, cola, PEPSI ONE, West	18	4.4	8	5	37	7	28	A	A	1	2 3	97535	1	NFNAP
	Carbonated, ginger ale	80	3.9	6	73	91	68	93	C	A	1	4	14136	2	Schultz 1976 Taves 1983
	Carbonated, grape soda	93	4.2	12	83	109	81	105	C	A	1	4	14142	2	Schultz 1976 Stannard 1991
	Carbonated, lemon-lime, fast food type, without ice	64		2	59	69			C	A	1	2 3	97536		NFNAP
	Carbonated, lemon-lime, SPRITE, all regions	48	4.0	36	4	81	39	56	A	A	1	2 3	14145	1	NFNAP
	Carbonated, lemon-lime, SPRITE, Mid-West	47	8.2	8	7	77	27	66	A	A	1	2 3	97537	1	NFNAP
	Carbonated, lemon-lime, SPRITE, Northeast	48	11.8	7	4	81	19	77	A	A	1	2 3	97538	1	NFNAP
	Carbonated, lemon-lime, SPRITE, South	59	3.6	13	35	76	52	67	A	A	1	2 3	97539	1	NFNAP
	Carbonated, lemon-lime, SPRITE, West	29	8.9	8	9	82	8	50	A	A	1	2 3	97540	1	NFNAP
	Carbonated, orange soda	84	3.6	28	65	101	76	92	C	A	1	4	14150	3	Featherstone 1988 Heilman 1999 Schultz 1976
	Carbonated, root beer	83	16.6	8	6	122	40	125	C	A	1	4	14157	1	Schultz 1976
	Carbonated, water, fruit-flavored	105	4.5	8	89	121	94	115	C	A	1	4	97541	1	Levy 1992-2003
	Chocolate-flavor beverage, mix for milk, powder	5		2					D	A	1		14175 14557	1	Kingman 1984
	Coffee, brewed	91		3	81	110			B	A	1	2 3	14209	1	NFNAP #
	Cranberry juice cocktail and blends, light, ready-to-drink	70	10.1	11	13	102	48	93	C	A	1	4	97542	1	Levy 1992-2003
	Fruit drink, CAPRI-SUN, ready-to-drink	71	2.5	129	12	110	66	76	A	A	1	2 3	14272	1	NFNAP
	Fruit drink, HAWAIIAN PUNCH, ready-to-drink	44	10.1	15	4	98	23	66	B	A	1	4	97543	1	Levy 1992-2003
	Fruit drink, HI-C, ready-to-drink	22	2.0	58	4	76	18	26	A	A	1	1 2 3	97544	1	NFNAP
	Fruit drink, MINUTE MAID punch, ready-to-drink	17	2.0	9	8	27	13	22	C	A	1	4	97545	1	Levy 1992-2003
	Fruit drink, other brands, ready-to-drink	54	5.4	30	10	108	43	65	B	A	1	4	14264	1	Levy 1992-2003
	Fruit flavored drinks, prepared from powder	42	17.3	10	2	93	0	90	C	A	1	4	14541	1	Featherstone 1988
	Fruit flavored drinks, KOOL-AID, ready-to-drink	43	9.8	18	3	103	22	63	B	A	1	4	14178 14276	1	Levy 1992-2003
	Fruit flavored drink, SUNNY DELIGHT, ready-to-drink	68	2.5	11	56	83	63	74	C	A	1	4	14435	1	Levy 1992-2003
	Fruit juice drink, apple, ready-to-drink	104		1					D	A	1		97546	1	Stannard 1991

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	Fruit juice drink, blends (not cranberry), ready-to-drink	49	7.5	8	22	80	31	67	C	A	1	4	14122 14327 14334 14341	1	Levy 1992-2003
	Fruit juice drink, FIVE ALIVE, ready-to-drink	8	0.3	3	8	9	7	10	C	A	1	4	97547	1	Levy 1992-2003
	Fruit juice drink, grape, ready-to-drink	32	21.2	3	9	74	0	123	C	A	1	4	14282	1	Levy 1992-2003
	Fruit juice drink, orange, ready-to-drink	55		2	19	90			C	A	1	4	42270	2	Levy 1992-2003 Stannard 1991
	Lemonade, ready to drink	25	7.5	13	3	80	8	41	B	A	1	4	97548	1	Levy 1992-2003
	Tea, brewed, microwave, all	322	4.9	36	260	383	312	332	A	A	1	2 3	97549	1	NFNAP #
	Tea, brewed, microwave, Mid-West	319	10.1	8	272	358	295	343	B	A	1	2 3	97550	1	NFNAP #
	Tea, brewed, microwave, Northeast	309	13.0	7	264	374	277	340	B	A	1	2 3	97551	1	NFNAP #
	Tea, brewed, microwave, South	322	4.9	13	260	383	312	332	A	A	1	2 3	97552	1	NFNAP #
	Tea, brewed, microwave, West	310	10.4	8	260	354	285	335	B	A	1	2 3	97553	1	NFNAP #
	Tea, brewed, decaffeinated, all	269	8.0	33	159	355	253	286	A	A	1	2 3	14352	1	NFNAP #
	Tea, brewed, decaffeinated, Mid-West	293	17.2	7	220	355	251	335	B	A	1	2 3	97554	1	NFNAP #
	Tea, brewed, decaffeinated, Northeast	279	15.9	7	237	342	240	318	B	A	1	2 3	97555	1	NFNAP #
	Tea, brewed, decaffeinated, South	264	11.5	11	217	331	239	290	B	A	1	2 3	97556	1	NFNAP #
	Tea, brewed, decaffeinated, West	247	19.7	8	159	312	200	293	B	A	1	2 3	97557	1	NFNAP #
	Tea, brewed, regular, all	373	6.2	63	257	533	360	385	A	A	1	2 3	14355	1	NFNAP #
	Tea, brewed, regular, Mid-West	393	16.8	13	312	533	357	430	A	A	1	2 3	97558	1	NFNAP #
	Tea, brewed, regular, Northeast	357	13.9	14	294	466	327	387	A	A	1	2 3	97559	1	NFNAP #
	Tea, brewed, regular, South	381	7.2	23	324	445	366	396	A	A	1	2 3	97560	1	NFNAP #
	Tea, brewed, regular, West	355	14.1	13	257	466	324	386	A	A	1	2 3	97561	1	NFNAP #
	Tea, iced, ARIZONA, ready-to-drink	123	6.3	21	84	191	110	136	A	A	1	2 3	97562	1	NFNAP
	Tea, iced, COOL NESTEA Natural Lemon, ready-to-drink	90	3.5	31	62	133	83	97	A	A	1	2 3	14137	1	NFNAP
	Tea, iced, LIPTON BRISK Lemon, ready-to-drink	72	4.8	63	38	207	63	82	A	A	1	2 3	97563	1	NFNAP
	Tea, instant, powder, unsweetened	89772		1					C	A	1		14366	1	NFNAP
	Tea, instant, powder, unsweetened, prepared with tap water	335								RPA	6		14367		
	Tea, instant, powder, with lemon and sugar	584		1					C	A	1		14370	1	NFNAP
	Tea, instant, powder, with lemon and sugar, prepared with tap water	116								RPA	6		14371		
	Thirst quencher (sport drink), GATORADE, ready-to-drink	34		1						A	1		14382	1	NFNAP
	Thirst quencher (sport drink), POWERADE, ready-to-drink	62		1						A	1		14382	1	NFNAP
	Water, bottled, AQUAFINA	5	0.6	16	1	9	4	6	A	A	1	2 3	97564	1	NFNAP
	Water, bottled, CALISTOGA	7		2					D	A	1		97565	1	NFNAP
	Water, bottled, CRYSTAL GEYSER	24		4					D	A	1		14556	1	NFNAP
	Water, bottled, DANNON	11	1.3	12	5	20	8	14	A	A	1	2 3	97566	1	NFNAP
	Water, bottled, DANNON FLUORIDE TO GO	78		1						A	1		97567	1	NFNAP
	Water, bottled, DASANI	7	1.2	20	2	19	4	9	A	A	1	2 3	97568	1	NFNAP
	Water, bottled, EVIAN	10	0.6	16	7	15	9	12	A	A	1	2 3	97569	1	NFNAP
	Water, bottled, NAYA	14		4					D	A	1		97570	1	NFNAP
	Water, bottled, PERRIER	31		1					D	A	1		14384	1	Stannard 1990
	Water, bottled, POLAND SPRINGS	10		1					D	A	1		14385	1	Stannard 1990
	Water, bottled, PROPEL FITNESS WATER	2		2						A	1		97571	1	NFNAP
	Water, bottled, SARATOGA	20		1					D	A	1		97572	1	Stannard 1990
	Water, bottled, VERYFINE FRUIT2O Water	6		2						A	1		97573	1	NFNAP
	Water, bottled, VOLVIC	34		1					D	A	1		97574	1	Stannard 1990
	Water, bottled, store brand	16		11					C	A	1		97575	1	NFNAP
	Water, frozen (ice)	11		3					B	A	1	2 3	97576	1	NFNAP
	Waters, tap, all regions, all (includes municipal and well)	71	2.8	288	1	193	66	77	A	A	1	1 2 3	97577	1	NFNAP
	Waters, tap, all regions, municipal $	81	2.9	238	2	193	75	86	A	A	1	1 2 3	14429	1	NFNAP
	Waters, tap, all regions, well	26	4.8	50	1	162	17	36	A	A	1	1 2 3	97578	1	NFNAP
	Waters, tap, Mid-West, all (includes municipal and well)	88	5.1	68	4	167	78	98	A	A	1	1 2 3	97579	1	NFNAP

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	Waters, tap, Mid-West, municipal	99	4.6	52	4	167	89	108	A	A	1	1 2 3	97580	1	NFNAP
	Waters, tap, Mid-West, well	53	12.2	16	5	162	27	79	A	A	1	1 2 3	97581	1	NFNAP
	Waters, tap, Northeast, all (includes municipal and well)	69	7.5	56	2	193	54	84	A	A	1	1 2 3	97582	1	NFNAP
	Waters, tap, Northeast, municipal	74	7.7	52	2	193	58	89	A	A	1	1 2 3	97583	1	NFNAP
	Waters, tap, Northeast, well	9	3.0	4	4	17	4	17	B	A	1	1 2 3	97584	1	NFNAP
	Waters, tap, South, all (includes municipal and well)	76	4.6	100	1	191	67	86	A	A	1	1 2 3	97585	1	NFNAP
	Waters, tap, South, municipal	93	4.0	80	9	191	85	101	A	A	1	2 3	97586	1	NFNAP
	Waters, tap, South, well	10	1.6	20	1	30	6	13	A	A	1	1 2 3	97587	1	NFNAP
	Waters, tap, West, all (includes municipal and well)	47	4.8	64	3	135	38	57	A	A	1	1 2 3	97588	1	NFNAP
	Waters, tap, West, municipal	51	5.5	54	3	135	40	62	A	A	1	1 2 3	97589	1	NFNAP
	Waters, tap, West, well	24	4.3	10	5	48	14	34	B	A	1	1 2 3	97590	1	NFNAP
Breakfast cereals:															
	Corn flakes	17	3.3	15	8	22	6	27	C	A	1	4	08020 08022 08076 08246 08269	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Farina, enriched, cooked	51	22.8	19	3	134	0	109	C	A	1	4	08113 08173	2	Featherstone 1988 # Ophaug 1983-1987 *
	Granola, with raisins	33		9					C	A	1		08220 08275 08284	1	Ophaug 1983-1987
	Grits, cooked	56	18.2	21	5	113	12	101	C	A	1	4	08091 08161	3	Featherstone 1988 # Ophaug 1983-1987 * Taves 1983 #
	Oatmeal, cooked	72	27.5	21	4	201	4	139	C	A	1	4	08121 08180	3	Featherstone 1988 # Ophaug 1983-1987 * Taves 1983 #
	Oatmeal, instant, flavored, prepared	50	10.4	9	16	88	26	74	C	A	1	4	97591	1	Jackson 2002 #
	Oat rings	50	4.5	11	45	54	0	107	C	A	1	4	08013	2	Kingman 1984 Ophaug 1983-1987
	Presweetened, ready-to-eat	24	6.1	17	8	46	7	41	C	A	1	4	97592	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Raisin bran	65	16.4	13	34	91	0	133	C	A	1	4	08026 08060 08061	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Rice, ready-to-eat	17	0.9	15	14	18	14	19	C	A	1	4	08015 08025 08065 08066 08156 08348 08378	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Rice and corn, lightly sweetened, ready-to-eat	31		2	31	32			D	A	1	4	08259	1	Jackson 2002
	Wheat, ready-to-eat	27	8.0	17	8	53	5	50	C	A	1	4	08089 08147 08148 08157 08379 08384	3	Kingman 1984 Ophaug 1983-1987 Taves 1983

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Cereal grains and pastas:															
	Macaroni and spaghetti, cooked	7		9	7	7			C	A	1	4	20100 20121	1	Ophaug 1983-1987 *
	Macaroni and spaghetti, uncooked	18	6.0	6	6	25	0	44	C	A	1	4	20099 20120	1	Kingman 1984
	Noodles, egg, cooked	6		9					C	A	1	4	20110	1	Ophaug 1983-1987 *
	Rice, cooked	41	12.8	21	3	79	10	72	C	A	1	4	20045	3	Featherstone 1988 # Ophaug 1983-1987 * Taves 1983 #
Dairy and egg products:															
	Butter	3	0.7	19	1	4	0	6	C	A	1	4	01001 01002 01145	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Buttermilk	4		9					C	A	1		01088 01176	1	Ophaug 1983-1987
	Cheese, American, processed	35		9					C	A	1		01042 01046 01048 01147 01149 01150	1	Ophaug 1983-1987
	Cheese, cheddar	35		1					C	A	1		01009 01168 01169	1	NFNAP
	Cheese, cottage	32	9.4	21	6	82	9	55	C	A	1	4	01012 01013 01014 01015 01016	3	Featherstone 1988 Ophaug 1983-1987 Taves 1983
	Cream, fluid, half and half	3		9	3	3			C	A	1	4	01049 01050 01051 01052 01053 01054 01199	1	Ophaug 1983-1987
	Cream substitute, powdered	112		9					C	A	1	4	01069	1	Ophaug 1983-1987
	Egg, cooked	5	0.7	63	2	12	3	6	C	A	1	4	01128 01129 01130 01131 01132	3	Featherstone 1988 Ophaug 1983-1987 Taves 1983
	Egg, raw	1		2					D	A	1		01123	1	Kingman 1984
	Milk, chocolate	5	0.8	11	5	6	0	15	C	A	1	4	01102 01103 01104	2	Kingman 1984 Ophaug 1983-1987
	Milk, evaporated	8	1.1	19	4	12	6	11	C	A	1	4	01096 01097 01153 01177	2	Featherstone 1988 Ophaug 1983-1987
	Milk, 1%	3	0.4	4	2	4	1	4	B	A	1	2 3	01182	1	NFNAP
	Milk, 2%	3	0.4	4	3	5	2	5	B	A	1	2 3	01079	1	NFNAP
	Milk, skim	3	0.1	5	3	3	3	3	C	A	1	2 3	01085	1	NFNAP

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	Yogurt, fruit, strawberry	9		9					C	A	1	4	01120 01121 01122	1	Ophaug 1983-1987
	Yogurt, plain, low-fat	12		9	12	12			C	A	1	4	01116 01117 01118 01119 01184 01187	1	Ophaug 1983-1987
Fast foods:															
	Chicken McNUGGETS, McDONALD'S	16		2	14	18			D	A	1	4	21229	1	Jackson 2002
	Coleslaw	11	1.4	4	8	14	6	15	D	A	1	4	21127	1	Jackson 2002
	Dessert, DAIRY QUEEN, BLIZZARD	13	0.9	6	10	16	10	15	C	A	1	4	97593	1	Jackson 2002
	Dessert, WENDY'S, FROSTY	19		2	19	19			D	A	1	4	97594	1	Jackson 2002
	French fries, McDONALD'S	115		2	38	193			D	A	1	4	21238	1	Jackson 2002
	Hamburger on roll, quarter pound patty, with condiments	28		9					C	A	1		21202	1	Ophaug 1983-1987
	Pizza	31	8.1	11	20	47	0	66	C	A	1	4	21224	2	Adair 1991 Ophaug 1983-1987
	Shake	14		9					C	A	1		14347	1	Ophaug 1983-1987
	Steak and cheese sandwich	37		1					D	A	1	4	21123	1	Adair 1991
Fats and oils:															
	Mayonnaise	9		9					C	A	1	4	04025 04026	1	Ophaug 1983-1987
	Margarine	5	3.6	11	2	9	0	51	C	A	1	4	04610	2	Ophaug 1983-1987 Taves 1983
	Margarine-like spread	25	9.1	6	5	62	1	48	C	A	1	4	04128	1	Jackson 2002
	Salad dressing, mayonnaise type	4	0.4	4	3	4	0	9	C	A	1	4	04018	1	Kingman 1984
	Salad dressings	27	5.9	15	16	44	8	46	C	A	1	4	97595	2	Ophaug 1983-1987 Taves 1983
	Vegetable oil, corn	1		9					C	A	1	4	04518	1	Ophaug 1983-1987
Finfish and shellfish products:															
	Crab, canned	210		1					C	A	1		15141	1	NFNAP
	Fish, cooked (includes broiled and fried)	18	2.9	4	15	21	0	54	D	A	1	4	97596	1	Taves 1983
	Fish sticks, baked	134		9					C	A	1		15027	1	Ophaug 1983-1987
	Shrimp, canned	201		1					C	A	1		15152	1	NFNAP
	Shrimp, fried	166		9					C	A	1		15150	1	Ophaug 1983-1987
	Tuna, light, canned in water	19		1					C	A	1		15121 5184	1	NFNAP
	Tuna, canned in oil, drained	31		9					C	A	1		15119 15124 15183 15185	1	Ophaug 1983-1987
Fruits and fruit products:															
	Apple juice, DOLE, ready-to-drink	58	6.9	22	15	127	43	72	A	A	1	2 3	09400	1	NFNAP
	Apple juice, JUICY JUICE, ready-to-drink	48	6.5	30	9	145	34	61	A	A	1	2 3	09400	1	NFNAP
	Apple juice, MINUTE MAID, ready-to-drink	28	2.8	32	8	81	22	33	A	A	1	2 3	09400	1	NFNAP
	Apple juice, MOTT'S, ready-to-drink	28	3.3	28	8	60	22	35	A	A	1	2 3	09400	1	NFNAP
	Apple, raw, with peel	3		1					C	A	1		09003	1	NFNAP
	Applesauce, sweetened	5	0.7	19	3	8	3	7	C	A	1	4	09020	2	Featherstone 1988 Ophaug 1983-1987
	Avocado, raw	7		9					C	A	1		09037	1	Ophaug 1983-1987
	Bananas, raw	2		1					C	A	1		09040	1	NFNAP
	Cantaloupe, raw	1		9					C	A	1		09181	1	Ophaug 1983-1987
	Cherries, sweet, raw	2		9					C	A	1	4	09070	1	Ophaug 1983-1987

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	Cranberry sauce	2		2					D	A	1		09081	1	Taves 1983
	Fruit cocktail, canned	9	3.0	12	5	15	0	22	C	A	1	4	09351	3	Adair 1991 Ophaug 1983-1987 Taves 1983
	Grapefruit, raw	1		9					C	A	1		09111	1	Ophaug 1983-1987
	Grapefruit juice	45	5.9	40	1	115	33	57	B	A	1	4	09123	2	Levy 1992-2003 Taves 1983
	Grape juice blend (apple and grape), JUICY JUICE, ready-to-drink	102	8.9	27	53	184	84	121	A	A	1	2 3	97597	1	NFNAP
	Grape juice blend (apple, grape and pear), MINUTE MAID, ready-to-drink	43	4.4	25	10	100	34	52	A	A	1	2 3	97598	1	NFNAP
	Grape juice blend (apple and grape), MOTT'S, ready-to-drink	27	3.2	18	10	60	20	33	A	A	1	2 3	97599	1	NFNAP
	Grape juice, WELCH'S, ready-to-drink	72	3.4	20	50	95	65	79	A	A	1	2 3	09135	1	NFNAP
	Grape juice, white	204	45.7	12	139	287	16	392	C	A	1	4	97600	2	Kiritsy 1996 Stannard 1991
	Grapes, raw	49	22.0	10	27	71	0	329	C	A	1	4	09132	2	Adair 1991 Ophaug 1983-1987
	Nectar, fruit	12	2.3	11	5	26	7	17	C	A	1	4	09403 09407 09408	1	Levy 1992-2003
	Orange, juice, frozen, concentrate	20		1					C	A	1		09214	1	NFNAP
	Orange, juice, frozen, concentrate, prepared with tap water	58								RPI	6		09215		
	Orange juice, DEAN, ready-to-drink	52	9.8	22	4	145	32	72	A	A	1	1 2 3	09207	1	NFNAP
	Orange juice, MINUTE MAID, ready-to-drink	31	2.8	51	3	72	26	37	A	A	1	1 2 3	09207	1	NFNAP
	Peaches, canned	7	0.4	28	4	8	6	8	C	A	1	4	09241 09370	5	Adair 1991 Featherstone 1988 Kingman 1984 Ophaug 1983-1987 Taves 1983
	Peaches, raw	4		9					C	A	1	4	09236	1	Ophaug 1983-1987
	Pears, raw	2	0.2	20	1	3	2	3	C	A	1	4	09252	3	Adair 1991 Featherstone 1988 Ophaug 1983-1987
	Pears, canned	8	1.3	20	2	11	4	11	C	A	1	4	09257 09374	3	Adair 1991 Featherstone 1988 Ophaug 1983-1987
	Pineapple, canned, juice pack	2		9					C	A	1	4	09268	1	Ophaug 1983-1987
	Pinapple juice, canned	6	1.4	24	1	15	3	9	B	A	1	4	09409	4	Adair 1991 Featherstone 1988 Levy 1992-2003 Ophaug 1983-1987
	Plums, dried (prunes), uncooked	4		9					C	A	1	4	09291	1	Ophaug 1983-1987
	Plums, purple, raw	2		9					C	A	1	4	09279	1	Ophaug 1983-1987
	Prune juice	60	23.5	21	17	115	0	135	C	A	1	4	09294	3	Kiritsy 1996 Ophaug 1983-1987 Stannard 1991
	Raisins	234		1					C	A	1		09298	1	NFNAP
	Strawberries, raw	4		9					C	A	1	4	09316	1	Ophaug 1983-1987
	Watermelon, raw	1		9					C	A	1	4	09326	1	Ophaug 1983-1987
Lamb, veal and game:															
	Lamb chop, pan cooked with added fat	32		9					C	A	1		17227	1	Ophaug 1983-1987
	Veal cutlet, breaded, pan cooked with added fat	21	15.1	11	6	36	0	212	C	A	1	4	17096	2	Ophaug 1983-1987 Taves 1983
	Veal, liver, pan cooked with added fat	5		9					C	A	1		17204	1	Ophaug 1983-1987

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Legumes and legume products:															
	Beans, baked, canned, with pork	54	13.0	11	41	67	0	219	C	A	1	4	16009	2	Kingman 1984 Ophaug 1983-1987
	Beans, mature, boiled	2	0.3	36	2	3	1	3	C	A	1	4	16032 16043 16072 16038	1	Ophaug 1983-1987 *
	Cowpeas common (blackeyes), boiled	3		9					C	A	1	4	16363	1	Ophaug 1983-1987 *
	Peanut butter, creamy	3		1					C	A	1		16098	1	NFNAP
	Peanuts, dry roasted, salted	16		9					C	A	1	4	16090	1	Ophaug 1983-1987
Meals, entrees and sidedishes:															
	Beef stew	57	3.7	10	47	68	46	67	D	A	1	4	22905	1	Featherstone 1988
	Casserole, beef, tomato and pasta	67		2					D	A	1	4	97601	1	Taves 1983
	Chicken potpie	75		9					C	A	1		22906	1	Ophaug 1983-1987
	Chicken and noodle casserole, homemade	16		9	16	16			C	A	1		97602	1	Ophaug 1983-1987
	Chili con carni, beef and beans, canned	45		9					C	A	1	4	22904	1	Ophaug 1983-1987
	Frozen meal, fried chicken, mashed potatoes, cornbread, and/or vegetable	48		9					C	A	1		97603	1	Ophaug 1983-1987
	Lasagna, homemade	18		9					C	A	1	4	97604	1	Ophaug 1983-1987
	Macaroni and cheese, prepared from mix	33	5.8	23	11	51	18	47	C	A	1	4	97605	3	Featherstone 1988 Ophaug 1983-1987 Taves 1983
	Mashed potato and gravy	84		1					D	A	1	4	97606	1	Adair 1991
	Meatloaf	30	3.4	19	18	40	21	38	C	A	1	4	97607	2	Featherstone 1988 Ophaug 1983-1987
	Spaghetti, with meat sauce	38	9.3	19	10	76	14	62	C	A	1	4	22401	2	Featherstone 1988 Ophaug 1983-1987
	Spaghetti, with sauce, no meat, canned	24	6.7	21	5	59	8	40	C	A	1	4	22914	3	Featherstone 1988 Ophaug 1983-1987 Taves 1983
	Ravioli, CHEF BOYARDEE, beef, with meat sauce, canned	13		2	12	15			D	A	1	4	22515	1	Jackson 2002
	Turkey, broccoli, cheese bake	28		2					D	A	1	4	97608	1	Taves 1983
	Turkey potpie	166		1					D	A	1		22528	1	Adair 1991
Nut and seed products:															
	Pecans, packaged, unsalted	10		9					C	A	1	4	12142	1	Ophaug 1983-1987
Pork products:															
	Bacon, cooked	22	6.9	11	15	29	0	110	C	A	1	4	10124	2	Ophaug 1983-1987 Taves 1983
	Bacon, raw	4		2					D	A	1		10123	1	Kingman 1984
	Ham, cured, baked	20	6.0	16	4	30	1	39	C	A	1	4	10151	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Pork, chop, baked	38		2	19	57			D	A	1	4	97609	1	Jackson 2002
	Pork, chop, pan cooked, with added fat	129		9					C	A	1		10178 10179 10180 10186 10197	1	Ophaug 1983-1987
	Pork, roast, cooked	42	0.6	11	42	43	35	50	C	A	1	4	10188	2	Taves 1983 Ophaug 1983-1987

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Poultry products:															
	Chicken, cooked (includes fried and roasted)	15	2.3	36	4	25	10	20	C	A	1	4	97610	2	Featherstone 1988 Ophaug 1983-1987
	Turkey, roast	21		2					D	A	1		05166 05200 05232 05256	1	Taves 1983
Sausages and luncheon meats:															
	Bologna	29	4.0	11	25	33	0	80	C	A	1	4	07007 07008 07960 07937 07959 07952 07010 07011	2	Kingman 1984 Ophaug 1983-1987
	Ham and cheese loaf	36		2	34	38			D	A	1	4	07032	1	Jackson 2002
	Hot dogs, beef	48		1					C	A	1		07022	1	NFNAP
	Sausage, pork	18		9	18	18			C	A	1	4	07064	1	Ophaug 1983-1987
	Sausage (includes salami, not hard)	41	10.2	11	31	51	0	170	C	A	1	4	97611	2	Ophaug 1983-1987 Taves 1983
Snacks:															
	Chips, corn and tortilla	50	4.7	13	43	59	30	70	C	A	1	4	19056	2	Kingman 1984 Ophaug 1983-1987
	Popcorn, oil popped	6	2.3	11	4	9	0	35	C	A	1	4	19035	2	Kingman 1984 Ophaug 1983-1987
	Potato chip	65	7.1	7	30	86	47	82	C	A	1	4	19411	1	Jackson 2002
	Potato chip, baked	106	15.5	4	60	131	56	155	D	A	1	4	42283	1	Jackson 2002
Soups, sauces, and gravies:															
	Sauce, cheese	29		2					D	A	1		06930	1	Kingman 1984
	Sauce, spaghetti, canned	37		2	16	58			D	A	1	4	06931	1	Jackson 2002
	Sauce, tartar	30		2					D	A	1	4	97612	1	Taves 1983
	Sauce, white	4		9					C	A	1	4	06166	1	Ophaug 1983-1987
	Gravy, beef	99		1					C	A	1		06116	1	NFNAP
	Gravy, brown, prepared from mix	57	20.9	19	10	120	3	111	C	A	1	4	97613	2	Featherstone 1988 # Ophaug 1983-1987 *
	Soup, beef bouillon, canned, reconstituted	29		9					C	A	1	4	97614	1	Ophaug 1983-1987 *
	Soup, chicken broth	61		1					C	A	1	4	06413	1	NFNAP
	Soup, chicken noodle, canned, reconstituted	35	7.0	19	14	55	17	53	C	A	1	4	06419	2	Featherstone 1988 # Ophaug 1983-1987 *
	Soup, clam chowder	36		2					D	A	1	4	97615	1	Taves 1983
	Soup, corn chowder	132		1					D	A	1	4	06725	1	Adair 1991
	Soup, minestrone	86		2					D	A	1		97616	1	Taves 1983
	Soup, pea	76		4					D	A	1		97617	1	Taves 1983
	Soup, tomato, canned reconstituted, with milk	7	0.8	10	4	8	4	9	D	A	1	4	06359	1	Featherstone 1988
	Soup, vegetable beef, canned, reconstituted	43	12.3	19	12	89	11	74	C	A	1	4	06741	2	Featherstone 1988 # Ophaug 1983-1987 *
Spices and herbs:															
	Pepper, black	34		8					C	A	1	4	02030	1	Taves 1983
	Salt, iodized	2		1					C	A	1		02047	1	NFNAP

Food Group	Item	Mean mcg/100g **	Std Error	Num datapts	Min Value	Max Value	Lower 95% EB	Upper 95% EB	Confidence Code	Derv. Code	Source Code	Statistical Comments	NDB No.	No. of Studies	References
Sweets:															
	Candies, caramels	27		9					C	A	1		19074	1	Ophaug 1983-1987
	Candies, milk chocolate	5		9					C	A	1		19120	1	Ophaug 1983-1987
	Candies, M&M MARS, "M&M's" Milk Chocolate Candies	17		2	15	20			D	A	1	4	19141	1	Jackson 2002
	Candies, REESE'S Peanut Butter Cups	9		2	7	11			D	A	1	4	19150	1	Jackson 2002
	Candies, M&M MARS, SNICKERS Bar	36		2	27	46			D	A	1	4	19155	1	Jackson 2002
	Gum	5		2					D	A	1	4	19163	1	Kingman 1984
	Frozen novelties, ice type, regular, all flavors	74	11.1	3	57	95	26	122	C				19283 19717	1	NFNAP
	Frozen novelties, ice type, sugar free, all flavors	89	1.7	3	86	91	82	96	C	A	1	2 3	43514	1	NFNAP
	Frozen novelties, juice type	77		1									43346	1	NFNAP
	Frozen novelties, ice cream sandwich	27		9					C	A	1	4	19887 19888 19889	1	Ophaug 1983-1987
	Frozen yogurts, chocolate	40		1					D	A	1		42186	1	Jackson 2002
	Frozen yogurts, vanilla	26		1					D	A	1		42187	1	Jackson 2002
	Gelatin desserts, strawberry, prepared	69	14.3	24	18	137	36	102	C	A	1	4	19173	4	Adair 1991 # Featherstone 1988 # Ophaug 1983-1987 * Taves 1983 #
	Honey, bottled	7		9					C	A	1	4	19296	1	Ophaug 1983-1987
	Jam, strawberry	19		2					D	A	1		19297	1	Taves 1983
	Jellies	73	8.7	13	64	90	35	110	C	A	1	4	19300	2	Kingman 1984 Ophaug 1983-1987
	Ice creams, chocolate	23	2.6	3	19	28	12	34	B	A	1	2 3	19270	1	NFNAP
	Ice creams, vanilla	15	1.1	4	14	19	12	19	B	A	1	2 3	19095	1	NFNAP
	Bread pudding	74		2					D	A	1		19167	1	Taves 1983
	Puddings, instant, prepared with whole milk	22	7.7	23	4	65	4	40	C	A	1	4	19185 19203 19319 19331	3	Featherstone 1988 Ophaug 1983-1987 Taves 1983
	Sugar, granulated	1	0.5	15	1	2	0	7	C	A	1	4	19335	2	Ophaug 1983-1987 Taves 1983
	Syrup, pancake	44	16.0	11	28	60	0	247	C	A	1	4	19129	2	Kingman 1984 Ophaug 1983-1987
Vegetables and vegetable products:															
	Asparagus, cooked	22	18.0	13	4	40	0	250	C	A	1	4	11012	2	Ophaug 1983-1987 * Taves 1983 #
	Beans, snap (includes cooked, canned, frozen)	19	6.6	36	4	62	4	34	D	A	1	4	11052	4	Featherstone 1988 # Kingman 1984 % Ophaug 1893 - 1987 * Taves 1983 #
	Beets, canned	26	0.3	11	26	27	22	30	C	A	1	4	11082 11084	2	Ophaug 1983-1987 * Taves 1983 #
	Broccoli, boiled	4		9	4	4			C	A	1	4	11091	1	Ophaug 1983-1987 *
	Cabbage, boiled	1		9					C	A	1		11110	1	Ophaug 1983-1987 *
	Carrots, cooked	47		2					D	A	1	4	11125	1	Taves 1983 #
	Carrots, raw	3	0.5	21	2	6	2	4	C	A	1	4	11124	3	Featherstone 1988 Kingman 1984 Ophaug 1983-1987
	Catsup	12	4.7	15	5	25	0	27	C	A	1	4	11935	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Cauliflower, boiled	1		9					C	A	1		11135	1	Ophaug 1983-1987 *

Food Group	Item	Mean mcg/100g **	Std Error	Num datapts	Min Value	Max Value	Lower 95% EB	Upper 95% EB	Confidence Code	Derv. Code	Source Code	Statistical Comments	NDB No.	No. of Studies	References
	Celery, raw	4		9					C	A	1		11143	1	Ophaug 1983-1987
	Coleslaw	10			9				C	A	1		11159	1	Ophaug 1983-1987
	Collard greens, boiled	27		9					C	A	1		97618	1	Ophaug 1983-1987 *
	Corn, frozen, kernels cut off cob, unprepared	15	12.2	6	1	39	0	67	C	A	1	4	11178 11910	1	Kingman 1984
	Corn, canned	18		9					C	A	1	4	11170 11903	1	Ophaug 1983-1987
	Corn, cream style, canned	28		9					C	A	1	4	11174 11906	1	Ophaug 1983-1987
	Cucumber, raw	1	0.7	11	1	2	0	10	C	A	1	4	11205 11206	2	Kingman 1984 Ophaug 1983-1987
	Lettuce	5	4.2	14	0	13	0	23	C	A	1	4	97619	3	Kingman 1984 Ophaug 1983-1987 Taves 1983
	Lima beans, immature seeds, frozen, boiled	7		9					C	A	1	4	11038	1	Ophaug 1983-1987 *
	Mixed vegetables, canned	37	6.5	10	24	57	19	55	C	A	1	4	11579 11581 43312	1	Featherstone 1988 #
	Mushrooms, canned	10		9					C	A	1	4	11262	1	Ophaug 1983-1987
	Onion rings, breaded, fried, frozen, heated	55		9					C	A	1		11295	1	Ophaug 1983-1987
	Onions, raw	1	0.1	12	1	1	0	2	C	A	1	4	11282	2	Kingman 1984 Ophaug 1983-1987
	Peas, green (includes cooked and canned)	29	5.0	36	8	57	18	40	C	A	1	4	97620	5	Adair 1991 # Featherstone 1988 # Kingman 1984 % Ophaug 1983-1987 * Taves 1983 #
	Peppers, sweet, green, raw	2		9					C	A	1	4	11333	1	Ophaug 1983-1987
	Pickles, cucumber, dill	24	20.3	12	4	44	0	281	C	A	1	4	11937	2	Kingman 1984 Ophaug 1983-1987
	Potatoes, boiled	49		2					D	A	1		11365	1	Taves 1983 #
	Potatoes, french fried, frozen, heated	26	4.1	21	6	41	16	35	C	A	1	4	11403 11407 11838 11840	3	Adair 1991 Featherstone 1988 Ophaug 1983-1987
	Potatoes, hashed brown	44		2					D	A	1		11390	1	Taves 1983
	Potatoes, mashed	39	11.0	23	9	84	12	66	C	A	1	4	11371	3	Featherstone 1988 Ophaug 1983-1987 Taves 1983
	Potatoes, puffs, frozen, prepared	6		2	6	6			D	A	1	4	11399	1	Jackson 2002
	Potatoes, russet, baked	45		1					C	A	1		11356	1	NFNAP
	Potatoes, scalloped	31	10.1	19	4	62	6	57	C	A	1	4	11372 11844	2	Featherstone 1988 Ophaug 1983-1987
	Radishes, raw	6		9					C	A	1	4	11429	1	Ophaug 1983-1987
	Sauerkraut, canned	7		9					C	A	1		11439	1	Ophaug 1983-1987
	Spinach, cooked	38	16.3	20	20	70	0	108	C	A	1	4	11458	2	Ophaug 1983-1987 * Taves 1983 #
	Squash, cooked (includes summer and winter)	2	0.0	20	2	2	2	2	C	A	1	4	97621	2	Ophaug 1983-1987 * Taves 1983 #
	Sweet potatoes	14	7.0	11	7	21	0	102	C	A	1	4	97622	2	Ophaug 1983-1987 Taves 1983
	Sweet potatoes, candied, home prepared	8		9					C	A	1		11659	1	Ophaug 1983-1987

Food Group	Item	Mean mcg/100g **	Std Error	Num datapts	Min Value	Max Value	Lower 95% EB	Upper 95% EB	Confidence Code	Derv. Code	Source Code	Statistical Comments	NDB No.	No. of Studies	References
	Tomatoes, canned	6	1.9	3	3	9	0	14	D	A	1	4	11531 11535 11885	1	Jackson 2002
	Tomatoes, raw	2		1					C	A	1		11529	1	NFNAP
	Tomato juice, canned	7	3.1	11	4	10	0	46	C	A	1	4	11540	2	Ophaug 1983-1987 Taves 1983
	Tomato sauce, canned	35		1					C	A	1		11549	1	NFNAP
	Tossed salad	5		2	3	8			D	A	1	4	97623	1	Adair 1991

**mcg/100g = ppm * 100 (beverages corrected for specific gravity)

$ Municipal water is not well water.

* Cooked in deionized water.

Cooked/brewed in tap water.

% Unprepared.

Dr. Lynn Dowswell, D.C.
Chiropractic and Wellness Centre
104- 17 Colborne St. W.
Orillia, Ontario
L3V 6H2
705-325-0832

March 27, 2012

Mayor and Council Members
Orillia City Centre
50 Andrew Street
Orillia, Ontario
L3V 7T5

Re: Fluoridation of the drinking water in the city of Orillia

In this letter I will not discuss the science for or against drinking water fluoridation in Orillia. The issues I am writing to is the human right to exercise the freedom to make voluntary decisions about personal health and family health in a manner that fulfills the standard of informed consent outlined by legislation and expected by the public for all healthcare.

To date, the main focus in the municipal drinking water fluoridation has been on the science. I think there are much bigger issues that are being side stepped; that is the basic human right for freedom of choice in one's own healthcare and the right to informed consent. Does municipal drinking water fluoridation allow for freedom of individual choice? Does municipal drinking water fluoridation meet the standard of healthcare informed consent for an individual legislated in this province? These are the questions that have the greatest significance to consider for the members of our community by Mayor Orsi and the seven Council Members of Orillia. The Mayor and Council Members represent each person in the city of Orillia and each individual that has the right to exercise the freedom of choice for their health.

Dealing with diversity in the public means treating people equally with respect and compassion, but not treating each person the same because they are each an individual and inherently different with different health needs. Is everyone the same with identical genetics? No. Does each person have different health needs? Yes. Does mass fluoridation of drinking water meet the diversity of our population? No. There are exceptions to who would choose fluoridation.

Freedom of choice is a basic human right that is respected in Canada. Informed consent is a strong legislated health mandate in Canada. These are rights of permanent residents, our family members, transient residents, tourists, and people of any age, gender, and medical history. Both rights will be violated for each individual by drinking water fluoridation in the City of Orillia. Do you propose to post signs in the City of Orillia informing the public of fluoride in the drinking water? I do not feel that fluoridation of the municipal drinking water is embraced by the residents of Orillia 100%. This decision made by only 8 people for 40,000 plus people is in violation for freedom of personal choice for personal health and informed consent for personal healthcare.

Alternatives choices for public funding usage for dental health and cavity prevention can include funding programs targeted to those individuals at risk. These public programs can be in the form of education for dental hygiene, healthy diet, healthy and economic shopping and food preparation, and dental cleaning. This approach does meet freedom of choice and legislated standards for informed consent for individuals with diverse health needs and choices.

I implore you to put aside the scientific issue of which side is more right, and ask yourselves if the decision to fluoridate the municipal drinking water will be respecting everyone's rights.? I can only see one right answer, and that is a very clearly "NO".

Sincerely,
Dr. Lynn Dowswell , D.C.
Chiropractor

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Tuesday, March 27, 2012 9:10 PM
To: JASON COVEY
Subject: RE: Fluoridation Equipment questions and request for FMEA documents - FURTHER INPUT

Jason;
I request that this e-mail be entered into the public record for the fluoridation issue.

Thanks for the explanation. But this raises even more concern - how is the water/fluoride mix in the 1 inch line mixed in with the large flow in the much larger line? My knowledge of fluid flow and mixing rates would give me concern that these two fluid streams may not be 100% mixed by the time the sampler is reached unless you use an impeller or mixing device of some sort. How do you make sure that the fluoride is completely mixed at the point where the fluoride sensor is placed? If it is not, the sensor could be missing a sample that contains the fluoride, resulting in the system feeding in way too much fluoride, resulting in the people of Orillia drinking much higher amounts of fluoride than anyone ever intended.

I spent some considerable time today talking to the people at METCON.
I first spoke to one of their Engineers. He also helped me to understand how the system would work in a typical installation. We talked at length about the details, dual pumps and how to perform maintenance without shutting down the system, and in particular, the details of the monitoring device, fluoride sampler, sensors, etc. It sounds like they purchase many of these components and design the system around existing components. As for the exact details of the internal workings, he was not that clear. I tried to have a detailed discussion about component failures and the resulting consequences, but he was not able to engage on this level. I asked him over and over again, phrasing my questions in many different ways, about details of a Safety Analysis and after a long discussion, he stated that, to his knowledge, based on over ten years of working on these systems, he had never been asked these questions before and that he was not able to provide such an analysis. He felt no one else in the Co. would be doing this, if it was not in his Dept.

I then asked to be transferred to the Sales Dept. - spoke to Brabal Ray. He also had very little knowledge of the Safety Analysis concept and felt that this would not be farmed out to a third party to his knowledge.

Jason, this really worries me - ie these systems are not NEARLY AS SAFE as they should be, in light of the fact that we are "playing with potential harm to humans".

You have stated that some form of Risk Analysis and Risk Analysis Outcomes are mandated under ODWQM Standards and will be done for inclusion in your Operational Plan. I would be interested in knowing how an appropriate analysis could be even possible without detailed knowledge of the internal workings of the vendor supplied components? In addition, this type of analysis is always done

by a specialist in the field - an Engineer trained in this area to question the consequences of a failure in every wire, connector, electronic component, sensor, relay, valve, pump, etc to identify dormant failures that may not even be evident by monitoring staff. When the details are understood and the result of a failure is deemed to be unacceptable, a warning system, periodic check, or some other action is taken or put in place to mitigate against this eventuallity.

If this type of Safety Analysis is to be performed by your staff, could you please ask the types of questions outlined above so that the citizens of Orillia CANNOT BE HARMED BY THIS SYSTEM. I am dumbfounded to think that anyone looking at the "BIG PICTURE" would feel that the very small advantage (suspect at best) is worth this kind of risk!

I also point out that, starting Jan 1, 2013, individuals within the Municipality will become PERSONALLY liable for any actual or perceived damages caused to any individual citizen. I am told that there is usually a wave of law suites from a few disgruntled citizens anyway, every time a system like this is introduced!

Like I said to you the last time we met - I would not want to be in your shoes - a very tough position to be in!

Jason, if the town goes ahead with water fluoridation, please can you ensure that there is a requirement in the RFP documents that will result in proper Safety Analysis being done by the designer of the system you purchase so that we can all feel better about this. There may be other suppliers out there that could do a much better job of this than METCON. Just a thought.

Steve Goulter

Subject: RE: Fluoridation Equipment questions and request for FMEA documents.
Date: Mon, 26 Mar 2012 16:27:32 -0400
From: JCOVEY@orillia.ca
To: goulter255@hotmail.com

Hi Steve,

In a typical liquid feed system, the fluoridation chemical is pumped through a small diameter feed line (i.e. 1 inch) to an injection point. You can picture this as a perpendicular connection of the 1 inch line into the large diameter water pipe. Downstream of the injection point, there is a continuous fluoride analyzer measuring fluoride levels before water enters the distribution system. Gravenhurst has a system like this and I have been up to their water plant to get a tour and to talk to the Operations staff.

Under the Ontario Drinking Water Quality Management Standard, we are required to document Risk Analysis and Risk Analysis Outcomes in our Operational Plan which are similar to the FMEA process used in the automotive and manufacturing industries. These will be completed for fluoridation systems should the decision be made to add them to our Water Filtration Plant and West Orillia Well.

Jason R. Covey, P. Eng.

Water & Wastewater Engineer

Public Works - Engineering Division

City of Orillia

705-325-2227

jcovey@orillia.ca

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Thursday, March 22, 2012 10:39 PM
To: JASON COVEY
Subject: Fluoridation Equipment questions and request for FMEA documents.

Jason;
In looking at the "METCON" brochure, it appears that the water fluoridation equipment "treats" the water flowing thru a 1 inch line. All city water must flow in at least a 6 inch pipe. Please can you help me to understand how this system works in detail?

Have you made a trip to say Gravenhust or Bracebridge to see this equipment as installed?

I am still concerned about the Failure Modes and Effects Analysis. Please could you send me a copy of the FMEA for the system in its installed environment that shows a detailed analysis of every conceivable failure and the consequences of each failure mode. As you know, this type of analysis is require for every system and every component in that system. This is of paramount importance for a system such as this, where a failure could potentially kill or seriously injure citizens. I am specifically concerned about what happens when the water flow stops, the toxic Hexafluorosilicic Acid (HFSA) still flows, making the concentration of HFSA shoot up to very toxic levels, then the water flow starts up again, delivering this "slug" of very harmful "water" to your kitchen tap. WHAT HAPPENS IN THIS CASE - DOES ANYONE EVEN KNOW ITS HAPPENED? The FMEA will outline this in detail.

I also request that the FMEA be entered into the public record for the fluoridation issue.

Thanks for your help.
Steve Goulter

A Review of the Case for Fluoridation In Orillia

GW Cooper, PEng, BEng, MBA

Public Policy Advisor

People for Save Drinking Water

March 27, 2012

Slide 2: Why We're Here

- Aim: to assess the SMDHU's case for fluoridation as presented in its January 2009 Oral Health Report and its June 20, 2011 presentation to Orillia Council.

- Orillia has never had Community Water Fluoridation
  - Among the 10 largest communities in Simcoe Muskoka, **elementary school children in *Orillia have the most severely decayed teeth*** (SMDHU screening data, 2009-2010)

This should be updated for 2007, 2008, 2010, 2011 so that a trend analysis can be done for Council.

- Fluoridation is a***proven safe and effective* way to improve oral health*** by reducing tooth decay and cavities

The scientific literature supporting this claim should be cited or else be deemed as unsubstantiated. Also, SMDHU's claim does not recognize the concurrent adverse health effect of dental fluorosis. This review will provide science-based evidence showing fluoridation is ineffective as a tooth decay preventive and unsafe for dental and general health.

- Fluoridation is a challenging, polarizing issue
  - ***Our Goal: Address any misconceptions and provide accurate, up-to-date information***

The info from SMDHU is incomplete, misleading, and outdated. Due diligence will show it is not a sound basis on which Orillia Council should decide whether to fluoridate Orillia's water. Council needs to balance benefits and risks, collective and individual rights, economic, environmental, and social values in an open-minded and even-handed way as it and only it should discern what the public interest is.

Slide 3: What is Fluoride?

- Fluoride ***naturally occurs*** in rocks, soil, air and water.

This canard is irrelevant and grossly misleading. Fluoridation typically uses highly corrosive and toxic Hydrofluorosilicic Acid (HFSA) as the main source of fluoride. HFSA is a man-made chemical containing arsenic, lead, mercury, radium and other harmful elements taken as-is from scrubbers of phosphate refineries. HFSA is not benign and has never been subjected to toxicology tests by NSF or any government agency using the NSF Standard 60. As its safety is unproven, its use to fluoridate drinking water is not legal.

- **Most natural water sources in Ontario have less fluoride than municipal fluoridated water systems (too low to protect teeth)**

Per CDC's 1999 scientific literature review, the predominant way to protect teeth from cavities is to use fluoride topically (e.g. toothpaste, varnishes, gels) rather than to ingest it via drinking water. See Mortality and Morbidity Weekly Review, no. 41 (October 22, 1999): 933-40.

- Some areas: At much greater concentrations (>5x average levels) – but none in Ontario

Slide 4: How Does Fluoride Work?

- ***Fluoride makes the outer layer of teeth (the enamel) stonger***

By Permission, Dr. H Limeback

Another incomplete and misleading remark by SMDHU since in moderate/severe dental fluorosis and skeletal fluorosis, fluoride accumulates over time making both teeth and bone more brittle. Note fractured teeth per Limeback photo. Also see Chachra, Limeback, et al Journal of Dental Research, 2010; 89(11) .

- When the outer layer is strong, teeth are less likely to develop cavities

In cases of moderate/severe dental fluorosis, children are likely to have more cavities in the biting surfaces of their teeth where fluoride disrupts crystal structure.

- Fluoride protects teeth in two ways.Water fluoridation does both:
  - –***Topical***: delivered to the surface of the teeth.

SMDHU fails once more to cite any research literature documenting a topical effect from ingesting fluoride. A search of PubMed's web site yielded two papers. The estimated amount of ingested fluoride available in saliva is about 0.003 ppm or 1% of baseline. This is so miniscule that its effect is insignificant. The estimate is derived from Nagpal DI, et al Comparison of Salivary Fluoride Levels etc. J Indian Soc Pedod Prev Dent 2007; 25:20-2 originally done using dentifrices. Adjustments were made to reflect a typical fluoridation level in drinking water of 0.7 ppm and a 50% kidney excretion rate. A worksheet for this derivation is available on request.

Slide 4 Cont'd: *How Does Fluoride Work?*

–***Systemic***: fluoride is ingested into the body and is incorporated into the tooth structures

SMDHU omits noting that due to uncontrollable and excessive dosage, ingested fluoride is also found in blood, soft tissue organs like arteries, thyroid, pineal, kidney, brain and cells likely resulting in adverse structural, hormonal, and cellular effects. These various effects are documented and assessed in The Case Against Fluoride, How Hazardous Waste Ended Up in Our Drinking Water and the Bad Science and Powerful politics That Kept It there, 2010, co-authored by Drs. P. Connett, J. Beck and H. S. Michlem.

Slide 5: What is Community Water Fluoridation?

- The process whereby fluoride is added to the water supply and adjusted to a level that will ***optimize dental benefits while avoiding adverse effects.***

Original 1940's research on "optimum level" was weak on evidence, per Warren, Levy, et al, 2009 and was not based on a direct assessment of how intake related to outcomes for dental caries or dental fluorosis. They concluded it is problematic today to determine an optimal fluoride intake due to many variables determining full fluoride intake. Also Toronto Water yearly reports show wide variances in fluoride levels. No optimum level = no optimum dosage or control = adverse health effects and no benefits. This raises liability issues for Orillia Council re its statutory standard of care accountability in SDWA s.19.

- Fluoride additives are ***required to meet rigorous standards*** of quality and purity before they can be used and the process is ***carefully monitored and controlled***

This is not true. Fluoride is not just an additive. Per Supreme Court of Canada 1957 decision in Forest Hill vs Metro Toronto, HFSA is a medicine. It has never been approved as a drug for safety (toxicity) or efficacy by Health Canada. It is not subject to Best Manufacturing Practices regulations. Its dosage in water varies by process control at the treatment plant, patient age, work or other activities, underlying health conditions, and the weather. Patient dosage is not regulated, monitored, or assessed by public health officials, dentists, or MDs. NSF and suppliers do not accept any liability for its use. Nor does the ODA, RCDSO, CMA, GO, or Health Canada. Such liability falls exclusively on municipalities per your standard of care responsibilities under SDWA 2002, s.19.

Slide 6: Water Fluoridation in Ontario

- In Ontario, ***76%*** of the population is fluoridated. (Health Canada, 2007)

This too is outdated and 2011 census numbers should be available in mid-2012. With some 287,546 Ontarians in 11 urban centres becoming fluoride-free since 2008, the percent fluoridated has most likely fallen below the level cited above.

- Opposition in Waterloo & Calgary resulted in the discontinuation of fluoridation.

SMDHU paints an incomplete and thus misleading picture. Since 2008, 21 Canadian communities including Dryden, Thunder Bay, Amhertsburg, Lakeshore, Niagara, Waterloo, Kingston, Quebec City, Gatineau, Vercheres, Moncton, Dieppe, Lake Cowichan, Churchill have rejected fluoridation. This plus greater reliance on bottled drinking water reveals a growing trend across Canada towards fluoride-free drinking water.

- Recent challenges to fluoridation in Toronto, Peel, Hamilton, Muskoka, Tottenham, Lethbridge and Cape Breton ***All have reaffirmed their commitment to Community Water Fluoridation***

In January 2012, Peel Council demanded Health Cda and MOH-LTC prove HFSA is safe for people and the environment and be classed as a drug. Peel Council still has the fluoridation issue under active review as it does not accept that fluoridation with HFSA is safe.

Slide 7: Fluoridation Reduces Tooth Decay

- Studies show that community water fluoridation ***reduces tooth decay by 20% to 40%***[1]

[1]Newbrun E. Effectiveness of water fluoridation. J.Public Health Dent 1989; 49(5):279-89. Brunelle, Carlos Recent trends in dental caries in US children and the effect of water fluoridation. J Dent Res 1990; 69

Note the dates of the two cited reports. Nine more recent studies paint a very different picture. CDC, 1999 shows the topical use of fluoride is mainly responsible for lower tooth decay. Maupome, Clark, et al, 2001 found decay rates dropped over 5 years after 3 BC communities ended fluoridation. WHO Survey, 2005 shows 14 unfluoridated countries have decay rates comparable to 4 fluoridated ones. Ito, 2007 found no difference in caries levels or severity between fluoridated Brampton and fluoride-free Caledon. Pizzo, et al, 2007 review of 2001-2006 science literature concluded caries decline is more attributable to topical use of fluoride than water fluoridation. Azarpazhooh, 2007 reviewed 12 studies and found no difference in caries incidence between fluoridated and formerly fluoridated communities 3 years after the latter ended fluoridation. Levy, Warren, et al survey, 2009 noted it couldn't confirm fluoridation reduces cavities. SMDHU report, 2009 found 4 unfluoridated DHUs with lower DFMT scores than S-M, 2 fluoridated ones with higher DFMTs, 9 fluoridated ones with scores comparable to S-M's. Middlestaedt, 2011 analysis of Statistics Canada data showed fluoridated Ontario and unfluoridated Quebec have virtually the same tooth decay rates. The cumulative evidence from these scientific reports favours retaining the option of HFSA-free water.

Slide 7 cont'd: Fluoridation Reduces Tooth Decay

- ***Beneficial to all ages***, in both primary and permanent teeth – children, adults, seniors

SMDHU makes yet another unfounded and disproven claim. Beyond the fact that ingested fluoride is not effective in reducing tooth decay, it has many adverse health effects. Fluoridated water can be so detrimental to the development of infants and toddlers that the ADA has since 2008 advised dentists to warn mothers not to use it in baby formula. By 2005 nation-wide surveys showed dental fluorosis among children had reached epidemic levels (41%) in the USA, with moderate/severe stages having tripled in two decades. The CDC now advises fluoride levels in water be no more than 0.7 ppm. The National Kidney Foundation advocates those with impaired kidneys to avoid fluoridated water, especially for dialysis treatments. Diabetics are counselled to drink fluoride-free water and other beverages. Seniors are encouraged to not ingest fluoridated water so as to reduce the risk of hip and other bone fractures. Two 2010 heart research reports demonstrated fluoride facilitates plaque deposits in and damage to arteries. Some 24 epidemiological studies in China, India, Mexico and other countries show links between fluoridated water and IQ suppression in the order or 5% among children. Over 100 animal studies show fluorides physically damage the brain. The relationship between ingested fluoride and dementia is being actively researched. The foregoing actual and possible health outcomes call for responsible elected officials to ensure the public interest is served by directing public health officials to apply the ethical principle of medical precaution. For Orillia Council, the precaution principle argues for continuing to avoid fluoridating its drinking water.

Slide 7 cont'd: Fluoridation Reduces Tooth Decay

- Effect is seen in addition to personal dental care (brushing/flossing/dental care)

Once again SMDHU has not provided Council with any scientific references in support of this claim. This is not acceptable public health policy practice.

- ***Particularly needed for vulnerable, low-income populations***

This is the so-called "great equalizer" argument that is now in disrepute given two major developments in 2011. Last April, the leadership (Dr. Andrew Young, Rev Durley) of the US black community in Georgia declared that fluoridated water was disproportionately harmful to its people and its continuation was unfair and an abuse of civil rights. In July, Margaret Moran, National President of LULAC, the largest Hispanic association in the US, passed a resolution opposing fluoridation. These are the two largest minority groups in the US with the most vulnerable and poor populations. In common, these entities rejected the mass medication of their members without respect for the medical ethics of informed consent and without regard by public health officials for scientific findings (see NRC Report, 2006) of the increased risk fluoridation poses to the health of sub-populations such as infants, the elderly, diabetics, kidney patients, and people with poor nutrition.

Slide 9: Community Water Fluoridation Safety

- Systematic reviews conclude that community water fluoridation ***does not cause*** any of the following: *cancer, bone fractures, reduced intelligence, kidney failure, immunotoxicity, reproductive and developmental toxicity, DNA toxicity, neurotoxicity or environmental impacts*[1]

[1] Issues raised by those opposed to fluoridation

SMDHU is not transparent as it fails to identify what specific reviews deal with each of these adverse health effects. As well, it is negligent in ignoring two most recent reviews, the NRC Report, 2006 and The Case Against Fluoride, 2010 by Drs. Connett, Beck, and Michlem which do address and assess all of the foregoing. There is compelling evidence in these referenced reviews to support cause-effect and/or associative relationships between fluoride and these adverse health effects and, importantly in cellular damages. The SMDHU, if it were to be objective, comprehensive, and balanced in its investigations and analysis by taking these references into full account, would have a duty of care to advise Orillia Council to exercise the precautionary principle of medical practice by continuing to avoid fluoridating its water system. Further, Council should recall that no government agency or the NSF has done any toxicological studies of the safety or efficacy of the fluoridating agent HFSA.

Slide 9 cont'd: Water Fluoridation Safety

- Levels of fluoride added in water are carefully monitored to an optimal level of 0.7 ppm. At this level, risk of fluorosis is exceedingly low.
  - Fluorosis (mild): fine white striations across the crowns of teeth

This SMDHU point makes many errors in fact. As noted earlier in this review, annual reports on fluoride levels in water treatment plants in Toronto show there are unusually wide variances ranging from -38% to +68% relative to the target level of 0.6 ppm. This reveals poor process control. Also per slide 5 herein, achieving an optimal level of fluoride is problematic. Thirdly, per slide 5, the risk of fluorosis is a function of dosage, bioaccumulation, time and other variables rather than just fluoride levels. And, as the CDC admitted in November 2011, the risk of fluorosis has reached epidemic proportions among 12-15 year olds in the USA. Finally, it again is misleading (bordering on a "big lie" in fact) for the SMDHU to only refer to mild fluorosis when surveys in the USA show the incidence of moderate/severe fluorosis has tripled over two decades.

- Issue in children: inadvertent ingestion of toothpaste

Toothpastes carry warnings about ingesting fluoride paste but no warnings exist about swallowing fluoridated drinking water. Swallowing a pea size amount (0.25mg) of fluoride toothpaste is the same as ingesting an 8 oz glass of water. Children should brush twice daily under active adult supervision and not swallow toothpaste and yet should have 8 glasses of water per day according to the Canada Food Guide. Thus, by drinking water, they can ingest up to 8 times the fluoride toothpaste burden each day.

Slide 10: Major Scientific Research and Reviews

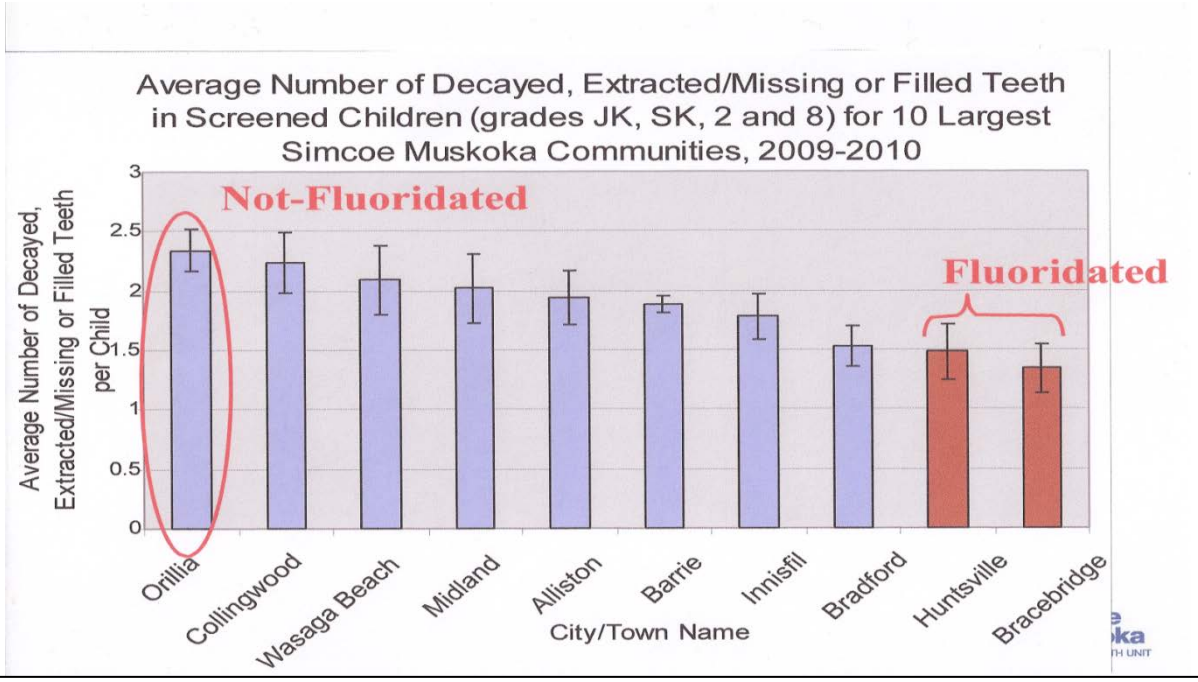
- Health Canada Expert Panel, 2007
- Oral Health in America: A Report of the Surgeon General, 2000
- Systematic Review of Water Fluoridation. UK/International study, 2000
- Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. US CDC, 2001
- Forum on Fluoridation. Ireland, 2001
- A Systematic Review of the Efficacy and Safety of Fluoridation National Health and Medical Research Council, Australian Government, 2007

Nowhere in its case for fluoridation does the SMDHU refer to any of these studies in support of any of its claims. Furthermore, SMDHU omits 5 major and recent reports here: NRC/NAS Review, 2006; Pizzo et al, Review, 2007; WHO Policy Statement, 2007; Levy, Warren, et al, 2009; and Connett, Beck, Michlem, 2010. Its analysis is myopic, unbalanced, lacks objectivity, and excludes relevant evidence-based facts. It parrots and protects the misguided position of the Chief Medical Officer of Health of Ontario rather than serves first and foremost Orillia's public interest.

Slide 11: Who Supports Water Fluoridation?

The 23 organizations listed by SMDHU in its slide 11 typically provide testimonials rather than perform rigorous scientific research into the fluoridation issue. Many, including the WHO and CDC, also support and even prefer other means of controlling tooth decay such as fluoride toothpaste, dental hygiene, proper diet, regular check-ups by professional dentists. Those opposing fluoridation in Canada include the 5,000-strong Canadian Association of Physicians for the Environment, the transborder Great Lakes United advocacy group, the Council of Canadians, and the municipal councils of 23 communities who since 2008 have rejected this practice. In the USA, over 4,000 medical, dental and environmental professionals have signed a statement calling for the end of fluoridation throughout America. Per the WHO survey, 2005, only 4 advanced countries are fluoridated whereas another 14 are unfluoridated. The drinking water of the vast majority of the world's population remains free of man-made fluoride such as HFSA. It should be clear from the foregoing that the right thing to do is to reject fluoridation.

Slide 13: Children in Communities in Simcoe Muskoka with Water Fluoridation Have Fewer Cavities



- **SMDHU has not presented multiyear trends in DFMT statistics for the 10 communities. Its one point in time picture could be misleading. Survey methodology is not described. Results could differ by age distribution of screened children in each community which may not be the same. Fluoride-free Bradford has the same DFMT score as fluoridated Huntsville but SMDHU offers no reasons. SMDHU has not provided comparable statistics for dental fluorosis in each community yet tooth decay and dental fluorosis are twin goals of public fluoridation policy. This one-sided analysis is unbalanced and misleading.**
- **DFMT average for the 8 fluoride-free towns is 1.9 whereas for the 2 fluoridated towns it is 1.4 for a difference of 0.5 DFMT or half a tooth. For children in JK, SK, Gr 2 with mostly primary teeth, this is an average decay rate of 10%. For Gr 8 children with mostly permanent adult teeth, this is an average decay rate of 4%. For Orillia children, the primary decay rate is 12% and the permanent decay rate is 7%. These differences in the two sets of decay rates are marginal and do not warrant the one-size-fits–all approach of mass medicating every Orillian being advocated by SMDHU. Better results can be obtained by using the funds to focus on greater dental hygiene and nutrition counseling and improved access to Ontario's CINOT and Healthy Smiles dental treatment programs.**

Slide 14: Fluoridation Makes a Difference:

Fewer Decayed Teeth & More Cavity-Free Teeth

Region	7-Yr DMFT (DecayedTeeth)	7-Yr % Caries Free (Healthy Teeth)
Halton (90% Fluoridated)	1.96	58
Simcoe Muskoka (7% Fluoridated)	**3.02**	**44.6**
Ontario (76% Fluoridated)	2.49	47.8

Again SMDHU fails to deal with Figure 3 from its January 2009 report showing that (a) two fluoridated DHUs had DFMTs greater than Simcoe-Muskoka and (b) four other fluoride-free DHUs had DFMTs lower than S-M. Thus it appears that SMDHU is being very selective in specifically comparing S-M to just Halton Region.

Also S-M's slide 14 does not reveal the year this data applies to and does not address the twin outcome of dental fluorosis.

These four omissions cast further doubt on the validity of the SMDHU case and the conclusions it draws from it.

Slide 15: Fluoridation Reduces Dental Program Costs

- **SNDHU provides no demographic data for both regions to determine if the two populations are comparable in size, composition, socio-economic status, and health profiles. Could be an apples vs oranges situation and hence misleading.**
- **SMDHU omits operating and capital costs for fluoridation in Halton.**
- **SMDHU ignores costs of dental fluorosis in Halton and Simcoe-Muskoka.**
- **SMDHU lacks a comprehensive approach to all-in costing.**
- **On the basis of these deficiencies, Council should guard against to being led down the proverbial garden path by SMDHU.**

Slide 16: Benefits of Fluoridation

- ***Evidence of both safety and benefits extremely strong***

SMDHU has failed to amass the scientific evidence either in scope or scale to substantiate this hyperbolic claim. In contrast, this submission has cited much of the science that shows fluoridation using HFSA is not proven to be safe nor does it provide significant benefits. In the past month media coverage in the USA and Canada point to both rising rates in dental decay among 3 to 5 year olds and high prevalence (41%) of dental fluorosis in older children. Fluoridation is not working. The foregoing SMDHU statement is unfounded in fact and disingenuous in nature.

- Similar responsibility to:
  - *Treating water with chlorine to provide safe drinking water*
  - *Adding vitamin D to milk to prevent rickets and ensure healthy bones*
  - *Adding iodine to salt to ensure healthy physical and mental development*

MOHs have no responsibility or authority for treating water with chlorine, or for adding vitamin D to milk, or for adding iodine to salt. It is wrong for them to imply otherwise or to allow elected officials to think this is so. This would constitute misrepresentation and further misleading of councillors. Unlike these other interventions, fluoridation is ineffective and unsafe to humans and other life forms. As such, public health officials have greater responsibilities to protect the public interest and, as licensed MDs, the precaution principle as well as the individual's right to informed consent to medical treatment. In this context, any lingering sense of responsibility to promote this obsolete and flawed fluoridation policy is misguided. As well, unlike fluoridation, there are low cost options available to people who want to exercise freedom of choice by removing, replacing or using other delivery modes for chlorine, vitamin D or iodine.

Slide 16 cont'd: Benefits of Fluoridation

- US Centers for Disease Control has recognized water fluoridation as ***one of 10 great public health achievements of the 20th century***

This was a self-congratulatory testimonial by the CDC for the CDC made prematurely in 1999. It continues to be mindlessly cited by public health officials who do not care to become conversant with more recent research into the safety, effectiveness, related adverse health effects, costs, and other, more benign and better options. The CDC claim was based on a faulty and incomplete analysis purporting to show but not prove a relationship between falling tooth decay and rising coverage of fluoridation. While the decline in tooth decay was based on a national survey, the fluoridation coverage only rose from about 40% to some 55% over the same 20 year time period with the 50% level only reached at the 15th year. CDC did not separate out the tooth decay rates in unfluoridated US communities. Neither did it bother to check WHO tooth decay survey results over this interval and beyond. If it had, the CDC would have realized that its claim was unfounded. The WHO data showed that 14 unfluoridated countries in Western Europe and Asia had the same or better reduction in tooth decay rates as the USA and 3 other fluoridated countries. The introduction and use of fluoridated toothpaste for dental hygiene is generally held as the main reason for this widespread improvement in dental health. Research reported by Dr. Osmunson, MPH, DDS, 2007 vividly demonstrated there is no cause-effect relationship between the extent of fluoridation and the degree of dental health in US communities. We are now in the 21st century and, as has been shown through the responses herein, fluoridation is today a dental health curse and a blight rather than a public health blessing or achievement. HFSA-based fluoridation has essentially joined tobacco, asbestos, leaded gasoline, mercury fillings, and certain vaccines (e.g. H1N1) which public health officials initially declared safe and effective for human use. Little wonder that the credibility of these officials has dropped to low levels recently.

Slide 16 cont'd: Benefits of Fluoridation

- ***Every $1 invested in community water fluoridation yields about $38 in savings each year*** *from fewer cavities treated*[1]

[1] J Publ Health Dent 2001;61(2):78–86

This cost-benefit study is fraught with methodological mistakes. First, the statistical data is over 30 years old and has never been updated. Second, it excludes the costs of other modes of fluoride use and the environmental degradation caused by over 99% of fluoridated water going back to ground and surface water as untreated waste. Third, it ignores the socio-economic costs arising from concurrent dental fluorosis which now affects over 40% of US children 12-15 years old. Veneers to cover irreparably damaged teeth can cost from $700 to $1,400 per tooth but are not covered by dental insurance. Veneers need to be replaced about 5 times in a lifetime. Fourth, a loss in wages at $18/hour was included for the time children and adults spend at the dentist rather than at school or work. Most adults today do not lose wages for dental or medical appointments. And, certainly no children or spouses at home do!

To make sound decisions today, supporting analyses must use today's data and be based on assumptions that reflect today's realities. For these reasons, Orillia Council should disregard the cited study in its entirety.

Slide 17: Conclusions

- The value of drinking water fluoridation should not be underestimated – it is ***one of the greatest preventive measures we have in the fight against dental decay***

SMDHU is purveying marketing hype above. Conversely, fluoridation's value should not be exaggerated. The CDC has stated that the topical application of fluoride post tooth eruption is the main means of dental decay prevention rather than the ingestion of fluoridated drinking water. Of the world's estimated population of 6.9 billion in mid-2011, only some 400 million people or 6% have access to fluoridated water. Some sixty years after its introduction, this low level of adoption is another measure of its ineffectiveness and lack of proven safety.

- It is ***a safe and effective public health measure that addresses inequalities in health, and benefits all members of the community***

For a multitude of science-based facts and reasons presented in this review, the above SMDHU statement on safety, effectiveness, and inequalities is found to have no merit and should not be relied on by Orillia Council.

- ***It helps contain the costs of health and dental care services***

In the absence of a full costing approach by SMDHU, the foregoing statement has not been proven, let alone estimated.

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Wednesday, March 28, 2012 12:18 AM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; Charles Gardner; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Subject: Massive data bank against Fluoride in all forms

I request that the following data from www.mercola.com be entered into the public record for the fluoridation issue.

Instructions to retrieve the data:
1. Go to www.mercola.com
2. Type in the word "fluoride" in the search bar at the top of any page
3. This will give access to 1885 articles on this topic!
4. Read each of these articles
5. Ask yourself if the risk is worth the effort - there is a considerable headwind building on this subject.
5. Vote NO to fluoridation! Please.

Steve Goulter

PS: 1.5 Million people, including over 100,000 health care professionals, receive this newsletter by email

The World's #1 Natural Health Website†
51-100 of 1,885 results

Vitamin D May Help You Avoid Dental Caries
… teeth. On the contrary, **fluoride** is a potent toxin, and … are showing signs of **fluoride** overexposure in the form … mottling on their teeth. **Fluoride** consumption has also …

Just Five Minutes on a Cell Phone Can Trigger Cancer
Be aware that cell phone regulations are grossly outdated, and there are health risks you need to consider when using your cell phone. Be aware that cell phone regulations are grossly outdated, and there are health risks you need to consider when using your cell phone.

The Toxic Toothpaste
… effects from **fluoride** exposure are … believes that **fluoride** should be banned … of toxicity, **fluorides** fall between … sign of chronic **fluoride** poisoning, and …

Natural Health Information Articles and Health Newsletter by Dr. Joseph Mercola
… recently passed a bill mandating infant **fluoride** warnings on all water bills in fluoridated … Fibromyalgia Finances Fitness/Exercise **Fluoride** Food Fructose/Sugar Games Gardening …

Pet Nutrition and Animal Wellness - Mercola.com
… Water Filters All Products Special Info Sites: Aspartame Cancer Fitness **Fluoride** Fructose/Sugar GMO Mercury Nutritional Typing Pets Vaccines Vitamin …

Dr. Joseph Mercola's Qualifications
… Factor Without Even Knowing It Western Journal of Medicine Vol 175 (6):378, Dec 2001 **Fluoride** and Apoptosis: Trading Dental Caries for Cellular Death? British Medical Journal July …

Mercola Health Video Library
… EMF Emotional Health Entertainment Euthanasia Exotic Fitness/Exercise **Fluoride** Food Fructose/Sugar Gardening GMO Heart Health Heart Murmur Hormones …

[CDC Water Fluoridation Stand Long Influenced By Dentists]
… exposed to **fluoride** as well … overexposed to **fluoride** because you … words, if **fluoride** has a detrimental … According to the **Fluoride** Action Network … reports about **fluorides**... One …

[Canadians Vote Against Fluoridated Water Supplies]
… conceded the benefits of **fluoride** are only topical—it … not caused by lack of **fluoride**, but instead by acids … signifies overexposure to **fluoride**. Fluoridation promoters …

[The Invisible Toxic Drug That's Lurking in Your Water Supply]
… 13th in celebration of **Fluoride** Awareness Week (Aug 7 - 13)! You can support **Fluoride** Action Network by purchasing … price of $10 during **Fluoride** Awareness Week. Visit …

[Who's Really Guarding Your Water Supply?]
… many reasons to avoid **fluoride** in all its forms, you … wonder how on earth **fluoride** could ever be approved … health. The issue of **fluoride** for health truly boggles …

[Finally the Media is Recognizing the Perils of Fluoridated Water]
… water. The problem with **fluoride** has become especially acute … evidence the recent Iowa **Fluoride** Study revealed grave concerns … harmed by the toxicity of **fluoride** in their bones and teeth …

[EMF | Electromagnetic Fields Safety & Health Effects]
… Natural Health Newsletter View Videos about EMF Hot Topics Aspartame Cancer **Fluoride** Fructose/Sugar GMO Mercury Free Dentistry Nutritional Typing Vaccines …

[Dr. Bill Osmunson on Dental Hygiene]
… staunch advocate against **fluoride**—discusses the importance … to rot. "No amount of **fluoride** will prevent bottle caries … is not the answer because **fluoride** is more toxic than lead …

[Tap Water Toxins: Is Your Water Trying to Kill You?]
… chlorine, and out of all the other toxins and contaminations present in your water, such as **fluoride** and miscellaneous pharmaceutical drugs, DBPs may be the absolute worst of the bunch …

[Pet Health Articles and Information - Mercola.com]
… Water Filters All Products Special Info Sites: Aspartame Cancer Fitness **Fluoride** Fructose/Sugar GMO Mercury Nutritional Typing Pets Vaccines Vitamin …

From: Steve Schandlen [mailto:steve.schandlen@rogers.com]
Sent: Wednesday, March 28, 2012 10:00 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: JASON COVEY; aodafeedback@ofah.org; ofah@ofah.org
Subject: Fluoridation In Orillia

To the Mayor and Councillors of Orillia:

As an avid sportsman and outdoorsmans in the Orillia area, I feel it is my duty to express that the addition of fluoride to drinking water and inevitably the waste water entering Lake Couchiching and the Trent Severn System, is an irresponsible action.

Fluoride is a pollutant when added to lakes, rivers, and ground water and many fish and aquatic creatures are negatively affected by its presence. Lake Couchiching, Lake Simcoe, and the Trent Severn do not need any further environmental stressors.

Please do the responsible thing for our local and provincial environment and do not introduce another source of this detrimental chemical.

Thank you,

Steve Schandlen
705-325-5066

cc: Ontario Federation of Anglers and Hunters

-----Original Message-----
From: Steph Miller [mailto:steph_miller5@yahoo.com]
Sent: Wednesday, March 28, 2012 11:24 PM
To: MAYOR EMAIL; Patrick Kehoe; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: JASON COVEY; orilliacitizensagainstfluoride@gmail.com; Scott Miller; Lloyd and Janet; Steph Miller
Subject: No to Fluoride!

To the attention of Mayor Angelo Orsi and Council,

I am a mother of 2 young children and absolutely beg of you, for the sake of the health of my family and our community, to VOTE NO FOR FLUORIDE. You have been presented the science- please do as you promised when elected, and make choices that will propel Orillia forward as a progressive community. Fluoridation of water has been proven repeatedly to be a regressive choice that degrades the health of community members who, ultimately, should have the right to make their own health and dental hygiene choices. Please please, VOTE NO FOR FLUORIDE.

Thank you,
Stephanie Miller
Oro-Medonte
Employee in Orillia and patron of Orillia restaurants and recreation establishments....therefore, consumer of Orillia water!

-----Original Message-----
From: lisa ingram [mailto:persephone@inbox.com]
Sent: Thursday, March 29, 2012 1:39 AM
To: Mayor and Council
Subject: No to Fluoride

Greetings, Councillor Patrick Kehoe.

My stance is a simple one: No.

We have tons of chemicals poured into our foods, as well as our water in the name of 'progress'. $25,000 is a hefty sum to pour more in. Fluoride is toxic to bodily cells. Have you ever read a warning on toothpaste? It says 'DO NOT EAT'. However, we'd be doing exactly that- Consuming fluoride.

Even worse, it will end up in our crops in high concentrations. A number of Cities have removed Fluoridation including Alberta.

My third point:

I do not use fluoride and I rarely if ever get cavities. I had not been in to see a dentist in ten years. They were astounded that my teeth were still in good condition! I did not even use fluoridated toothpaste (I only buy fluoride free).

I have a lot of health issues and have found going to preservative free breads (Orillia bakery), cutting out processed food and drinks (Cola, Pre-packaged foods) has improved my health immensely. Orillia has a tight budget. We cannot afford to add Fluoride to it- for our health or our taxes.

Lisa Ingram, Red Cross worker

_____

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 11:52 AM
To: Pete Bowen; Paul Spears; Patrick Kehoe; Michael Fogarty; MAYOR EMAIL; Linda Murray; Andrew Hill
Cc: Jason Covey
Subject: Emailing: Namaste

Bird, who, by age five had lost some of her athleticism and had developed bony lumps on her knees

This image clearly shows a slice through of Bird's deformed hoof.

Cathy's Horses DEFORMED and DISABLED by Fluoridated Water

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By Elizabeth A McDonagh

For Cathy and Wayne Justus, it was an important day. Six years married, they were leaving California for a new life at Pagosa Springs, Colorado, 900 miles to the East. Pagosa Springs was an enviable location, a small community nestling at the foot of the San Juan mountain range with spectacular views that changed with the seasons. Cathy and Wayne were thrilled with the property they had found there. It was a small farm where they could continue to breed the quality Quarter Horses1 for which they had already earned a reputation. For Wayne, the ever-changing scenery would provide inspiration for his fine paintings. He specialises in depicting the traditional life of the Western cowboy and incidents from the Civil War. (www.waynejustus.com.) To state it mildly,

Wayne loves horses and is pretty good at painting them. Cathy, who first met him in junior high school, shares his enthusiasm and cares devotedly for their animals.

Early days at Pagosa Springs were not easy for the couple. There was no house on the farm and priority demanded that they first build a barn to house the livestock. Their pioneering work rewarded, they partitioned off the barn and shared it with the horses and dogs. Only later would they build their house and for Wayne, a large log cabin studio with a traditional stove at its heart.

By 1981 the Justuses felt the success of their horse enterprise was assured. They had bought a new mare, Lil Belle Bonanza (Belle for short). Belle was the daughter of the world-leading Quarter Horse stallion Ricky Bonanza. When purchased, she was in foal and her previous foal Bonanza's Q T Bar, a filly affectionately known as Bird, followed her everywhere. Bird was developing normally and showing athletic potential. In 1982, and again in 1983, Belle produced large foals, both fillies, Satin Bow Nanza (Satin) and Perfectlydun Bonanza. The latter, nicknamed Baby Doe, soon became a great favourite with Cathy. She showed exceptional promise, being large and athletic with perfect legs and long sloping pastern

BOUTS OF COLIC

Wayne was away at times, trekking in the mountains or working as a cowboy to store up inspiration and ideas. When he was at home, he worked up to twelve hours a day on his paintings. Cathy took most of the responsibility for the house, the farm and the welfare of the horses. Everything seemed fine until 1985 when Belle gave birth to an unusually small filly. The foal survived only two months and at autopsy showed suppurating sores on its internal organs. No cause was found for this strange occurrence. Worryingly, Bird, by age five, had lost some of her athleticism and had developed bony lumps on her knees as well as a strange tendency to shake her head. All the horses were afflicted by recurring bouts of colic. It was not unusual for Cathy to have to deal with two to three colic cases in a month.

In 1986, Belle produced a son, Skip Classic Edition nicknamed Mister. The colt was smaller than expected but seemed otherwise normal. Belle's next foal was also a colt, Legendary Cowboy (Cowboy) born in 1987. At about the same time, a filly was born to Belle's daughter, Bird. Subsequent attempts to breed with Bird failed and she never had another foal.

Satin, born to Belle in 1982, was a good athlete with perfect legs but she suffered from chronic colic. She foaled a small filly (Fancy Frills Bonanza a.k.a. Frills) in 1987 but subsequently showed no heat-cycle. (In 1991, Satin was sold to a ranch in California after which her health problems improved and her new owners were pleased with her.) At about ten years of age, Frills' legs started bowing and growing bony lumps.

SKIN, THYROID & REPRODUCTIVE PROBLEMS

By 1990 it was very clear that all was not well with the Justuses' horses. Problems included colic and chronic coughs, lethargy, neurological problems, crooked legs, lameness, soft tissue hardening, hard lumps on bones, thyroid, skin, kidney and reproductive problems including chronic abscesses. It was in 1990 that real disaster struck. Belle was once again in foal and was taken to California for foaling and re-breeding. Cathy and Wayne received a call that the mare was in labour but could not deliver the foal. The vet explained that a Caesarean section would be both difficult and expensive. It would also necessitate the use of drugs which would leave Belle crippled with laminitis. Worse,

the mare would never again be able to conceive. The alternative of putting Belle down seemed kinder and this was the sad decision made. On autopsy, the foal, a colt, was found to be grossly abnormal. His head was less than half the normal length, he had no neck, no eyes and no nostrils. He had no muscles at all.

Meanwhile, Baby Doe had chronic colic and was lethargic, often falling asleep on her feet and falling to her knees. For a long time she showed no sign of coming into heat. Eventually, in 1997, she was pregnant. Cathy looked forward to her favourite producing a foal but when it happened there was cause for disappointment. Baby Doe's colt was extremely immature and cryptorchid (that is he had only one testicle). He did survive and was named Winning Gold Bonanza, Win for short. Shortly after birth he developed lumps under his skin, he urinated a lot and, as he grew, his hips appeared swollen. He was unsteady on his feet and often stumbled because his joints gave way causing his legs to go out from under him. By the year 2000, Baby Doe was suffering from continuous infections, thyroid problems, misshapen bones and hooves, joint problems, lameness, constant profuse urination and difficulty breathing. She exhibited the classic symptoms including the hairiness of 'Cushings Disease', (Equine Metabolic Syndrome).

Meanwhile, Baby Doe had chronic colic and was lethargic, often falling asleep on her feet and falling to her knees. For a long time she showed no sign of coming into heat. Eventually, in 1997, she was pregnant. Cathy looked forward to her favourite producing a foal but when it happened there was cause for disappointment. Baby Doe's colt was extremely immature and cryptorchid (that is he had only one testicle). He did survive and was named Winning Gold Bonanza, Win for short. Shortly after birth he developed lumps under his skin, he urinated a lot and, as he grew, his hips appeared swollen. He was unsteady on his feet and often stumbled because his joints gave way causing his legs to go out from under him. By the year 2000, Baby Doe was suffering from continuous infections, thyroid problems, misshapen bones and hooves, joint problems, lameness, constant profuse urination and difficulty breathing. She exhibited the classic symptoms including the hairiness of 'Cushings Disease', (Equine Metabolic Syndrome).

VETS COULD NOT OFFER EXPLANATION

Cathy was in despair. She tried changing the horses' feed but to no avail. None of her contacts could shed any enlightenment on the diverse health problems that were afflicting her horses. Vets had investigated Baby Doe's symptoms but none could offer any explanation, let alone a diagnosis. A purchased filly, Impressive N. Elegant (Siena) had developed a chronic cough and, in Cathy's words, "weird bumps all over her body" a few months after her arrival. The vets said she had "an immune dysfunction". But when Cathy and Wayne took her away to horse-shows for a few days the bumps would disappear.

"The problem must be at home", Cathy reasoned. She suspected the water supply, especially as she and Wayne always drank distilled water. It would have been prohibitively expensive to distil water for the horses. Cathy asked the vets whether it was possible that the fluoride added to municipal supplies since the mid eighties could be responsible for the horses' ills. She says, *"They looked at me as if I was nuts"*.

Baby Doe's second foal, Skips Winning Bnanza (Skipper) was born in 1999. He had very crooked front legs, urinary problems and an attitude that was less than desirable. Cathy decided to try the homeopathic remedy Calc.Fluor because, as she told me, "To find the correct remedy in homeopathy you look for the distinct symptoms. Since like cures like in homeopathy and fluoride causes skeletal problems it was the most likely remedy for Skipper's skeletal problems. It worked wonderfully." This success seemed to confirm Cathy's suspicions but there was still no proof and no professional believed as she did.

By the year 2000, Baby Doe was very sick. Attempts to get her in foal again were unsuccessful. Cathy and Wayne consulted six vets, including two from Colorado State University, where Baby Doe was taken for a time. The vets completely dismissed Cathy's fluoride-poisoning theory, one insisting that "fluoride is good for you". One vet diagnosed hormone problems including a very low T4 (thyroxin) count. E coli and Staphylococcal infections of the uterus were confirmed. The mare continued to eat and drink but her symptoms worsened.

Realising that the vets had no answers, Cathy turned again to alternative medicine. She used homeopathy, herbs chosen for their cleansing properties, fresh Aloe vera every day, acupuncture, acupressure, phototonic therapy and chiropractic. Most of the horses

showed some improvement in their general well-being but the gelding who, at five, had accompanied the Justuses from California, Sargeant Spot Cash (Sarge) died. He had developed sarcomas, Cushings Disease, abscesses, joint deformities, and breathing problems.

THE FLUORIDE DECEPTION

Snow remained on the ground throughout the winter of 2003/2004, something that had never happened in the previous ten years of comparative drought in Colorado. The horses' water in the outside tank lasted eighteen days. It was usually replenished every other day. Clearly, the horses were choosing to eat snow rather than drink the city water.(See image above left of Baby Doe's hoof during this winter period). As the winter months went by, the horses' health began to improve. For the first time in ten years there were no colics. All winter, Baby Doe shed the long hair that was a symptom of her 'Cushing's disease'. Her infections had resolved and she was again in foal. Two different vets confirmed this by ultrasound and palpation. Within two weeks of the snowmelt, colic was back. The Justuses, now certain that the city water had caused their problems, arranged for a supply of water from the San Juan River. After this, the colics ceased and, in some of the horses, other symptoms abated.

In 2004, Cathy read Christopher Bryson's book *The Fluoride Deception*. One passage in particular rang bells with her. Page 354 reported birth defects linked to an agricultural pesticide named Benlate, a compound of fluorine. Benlate had caused babies to be born without eyes, like Belle's last foal.

Sadly, Baby Doe's pregnancy was more than her sick body could handle. The mare was lame, lethargic, with thickenings on her joints, bones and spine. She had abscesses and oozing from lymph nodes. She *"popped and cracked with every movement"* Cathy told me *"She got so she didn't want to stand…she would lie down and as soon as her head touched the ground her eyes would roll back and roll around uncontrolled. Her legs would go like she was running…..and her whole body would shake. I timed her one day and she did this for eight minutes."* At the end Baby Doe's breathing became very laboured and shallow, her heartbeat went up to 120 beats per minute and she had to be euthanized.

On autopsy, Baby Doe was found to have no foal inside her. (It is probable that she had re-absorbed her foal or aborted it.) Cathy and Wayne requested tests to determine the fluoride levels in the mare's organs and other possible causes of her deterioration. Heart, lung, liver, kidney and blood samples were taken. Tests were done for various problems and infections including botulism and West Nile disease. All were negative. The vet reported that she could not find a laboratory that knew how to test for fluoride. Wayne buried Baby Doe and Cathy was distraught.

CHRONIC FLUORIDE POISONING

Determined that her fluoride theory should be checked out, Cathy made strenuous efforts, 'phoning from coast to coast to find a laboratory with the necessary facilities. Little more than a week later her persistence was rewarded. Cathy was given the name of Professor Lennart Krook, a veterinarian at Cornell State University, said to be an expert on fluoride. Cathy rang him up and told him she thought her horses had been poisoned by fluoridated water. "Symptoms?" was his reply. Cathy related the problems of the past fifteen years and the sad death of Baby Doe.

Dr. Krook told her he would need a bone to test for fluoride before he could give a firm diagnosis.

Cathy protested *"But the mare has been buried for over a week." "Dig her up." "I don't think I can do that emotionally."* said Cathy with tears in her eyes. *"You have to. Millions of people and animals are being poisoned by fluoride and the more evidence we can get to prove this the better."* The next day Wayne took out a backhoe and dug up the mare. He excised a foreleg, which he sent to Dr. Krook. A month later, the Justuses received the veterinarian's report. Baby Doe had suffered from Chronic Fluoride Poisoning. The owners of two other dead horses that had been drinking fluoridated city water from Pagosa Springs also sent leg bones to Dr Krook and they received similar diagnoses. Cathy's remaining living horses were also confirmed as suffering from 'Chronic Fluoride Poisoning'.

Cathy tells me that Dr Krook has spent fifty years of his life studying how fluoride affects animals. Their joint paper *"Fluoride Poisoning of Horses From Artificially Fluoridated Drinking Water"* has been peer reviewed and published in the Jan/March 2006 issue of *Fluoride, the quarterly journal of the International Society for Fluoride Research.*

A follow up paper reviewing allergic reactions of the Justus horses and improvement since the cessation of water fluoridation is being peer reviewed with hopes of its inclusion in the next issue of Fluoride.
Dr Krook has told Cathy that her horses are the first horses to be diagnosed with fluoride poisoning from fluoridated water. This is because vets and doctors are not taught to recognise the very varied signs of fluoride toxicity. Dr Krook has explained to Cathy how fluoride works insidiously at the cellular level. Chronic Fluoride Poisoning'.

It inhibits enzymes, the chemical catalysts which underpin all cellular chemistry, including the energy-production mechanisms of the mitochondria. It also alters the mineralisation of collagen, bringing about changes to the bones and teeth. It hardens the soft tissue of cartilage, tendons and ligaments causing joint pain which is often diagnosed as arthritis.

(PAWSD) voted unanimously to cease the fluoridation

On 25th January 2005, the Pagosa Area Water and Sanitation District (PAWSD) allowed a group of forty local residents, headed by Wayne and Cathy Justus, to voice their concerns about the fluoridation of the area's water. Cathy told how she and Wayne had successfully raised Quarter Horses (2) before their move to Pagosa Springs. Their horses, she said, were from long lines of champions and among the best in the world. Her voice breaking at times, she recalled all the tribulations of the previous fifteen years and how, after many vets had been unable to account for the horses' symptoms, Dr Krook had finally diagnosed Chronic Fluoride Poisoning caused by fluoridation of the local city water.

On March 29th 2005, the Board of PAWSD voted unanimously (1) to cease the fluoridation programme in Pagosa Springs. Cathy now gives talks to community groups about how fluoridation affected her horses and has been asked to address an anti-fluoridation conference in New York at the end of July.

In Cathy's words, *"People and animals die and the true cause and reason for that death is rarely known. Fluoridation is now in its sixtieth year. Chronic illnesses like cancer, Alzheimer's, thyroid problems, birth defects, reproductive problems and arthritis have grown in leaps and bounds since*

fluoridation started. Could there be a connection? From my experience in the last fifteen years – without a doubt."

Further information

1 *Note from Cathy It was an official unanimous vote on the books although one of the board members said, before he voted to stop fluoridation, that he still thought it was a good thing. He still voted to cease fluoridation despite his feelings about it. He said he didn't want to look like the odd man out.*

2 *The American Quarter Horse*
The European settlers of Virginia and the Carolinas crossed their imported thoroughbred horses with the Mustang ponies of the indigenous Chicasaw Indians. The progeny were generally chestnut but sometimes of other solid colours. They were intelligent, docile, easily broken in, strong and athletic. They stood at about 14 to 16 hands. They were used in the first horse races in America and came to be known as 'Quarter Horses'.
The breed, now one of the most popular horse breeds in the United States, was first recognised in 1941. Champion Quarter Horses have a short head, muscular neck, powerful shoulders, a short body and hind quarters and strong legs. The Quarter Horse is very versatile. It is strong, fast and capable of quick starts and tight turns. Besides racing, Quarter Horses are used for general riding, trekking, cattle work, rodeos and polo.

Krook and Justus published paper on Fluoride

A scientific paper titled *Fluoride Poisoning of Horses from Artificially Fluoridated Drinking Water* by DR Lennart P Krook and Cathy Justus was published in the January –March 2006 edition of *Fluoride, the Journal of the International Society for Fluoride Research.* [Research Report Fluoride 39(1)3-10] www.fluorideresearch.com
Krook and Justus state that the literature on fluorosis in cattle is extensive but "no carefully controlled studies have been conducted to determine the effect of excessive fluoride ingestion on horses". Artificial water fluoridation was introduced in the Pagosa Springs district in 1985, at a concentration of 0.35 to 1.3 parts per million (ppm). This was the only source of fluoride available to the Justus horses.

The effects of fluoride on the hooves, teeth, and bones of the horses are illustrated in the Fluoride paper. Bone analyses for fluoride were carried out on three deceased horses. Parts per million of fluoride in their dry bones were 587.1, 757.1 and 936.1 respectively. These figures are compared with the 162.2 ppm in the dry bone of a very old horse who had never drunk fluoridated water. The Paper points out that the tolerance of the Justus horses for fluoride was only a fraction of the 60 ppm cited by the National Academy of Sciences and other authorities as the upper level of tolerance for a horse.

In his editorial column in the same issue of Fluoride, Professor Albert W Burgstahlerpoints to the complete lack of understanding of fluoride's potential for harm exhibited by the veterinarians called to the sick horses. One reason for this is that extremely high so-called safe levels for fluoride in livestock were set in 1974 and have not been altered even though studies have clearly shown harm at as little as 1 ppm. Prior to 1974, the signs of fluoride poisoning were available in toxicology textbooks and reference manuals.

The similarities of the symptoms exhibited by the Justus horses, the multiplicity of those symptoms, the time taken for the problems to become evident, and the belief of the professionals that fluoride could not possibly be responsible should be reflected upon by everyone whose water supply is threatened by the menace of artificial fluoridation

Elizabeth studied nutrition from the age of twelve and her interest in the subject has continued unabated for over fifty years. A qualified teacher, she held teaching and Head of Department positions in secondary schools. She has also lectured at City of Manchester College of Higher Education, and other colleges in the UK.

Many years of study with the Open University led to the award of BSc(Hons). Since retirement, Elizabeth has given a number of speeches and has written articles, mainly on nutrition and fluoridation. She is an active member of National Pure Water Association (NPWA) which opposes the artificial fluoridation of water supplies. For information about NPWA:
42 Huntington Road, YORK, YO31 8RE, England.
Tel: + 44 (0)208 220 9168 Email: info@npwa.org.uk Website: http://www.npwa.org.uk

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 1:12 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Lead, Arsenic, Hydrogen Fluoride, Silicofluoride in Drinking Water » Sham

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://fluoride-class-action.com:80/sham very short vid, and very important reading

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 1:29 PM
To: Jason Covey
Subject: Fw: Fluoride's Link to Cancer, Metal Toxicity, Reducing Fluoride Toxicity - Video - iHealthTube.com

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=6682e1c9451e5b80

Fluoride's Link to Cancer - iHealthTube.com 6:37 min

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=b61b91c37a08b231

Genetics Can Determine Heavy Metal Toxicity - Video 3:07 min

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=6449961466a1d02d

Reducing Fluoride Toxicity 3:21 min

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ShareFacebook Twitter

Embed: <object id='ihealthplayer' width='440' height='315' data='http://www.ihealthtube.com/player/flowplayer.commercial-3.0.5.swf' type='application/x-shockwave-flash'><param name='movie' value='http://www.ihealthtube.com/player/player.swf' /><param name='allow

send this video to a friend
URL: http://www.ihealthtube.com/aspx/viewvideo.aspx?v=b61b91c37a08b231

Information
From: iHealthTube Admin **Added:** 3/12/2012
Time: 3:07 **Views:** 59
Dr. David Kennedy talks about how a gene is different in different people and how it determines how your body reacts and gets rid of heavy metals like mercury.
Contributor(s): Kennedy, David DDS
Tags: genes, genetics, mercury, alzheimers disease, heavy metals
Transcript: None

Bookmark & Share RSS RSS FEED

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 1:40 PM
To: MAYOR EMAIL; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; Patrick Kehoe
Cc: Jason Covey
Subject: Fw: Interesting Info On Fluoride from ihealthtube.com

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=67f2643ffdf6c526

The Myths of Fluoride - Video 4:28

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=405fb1ae16cdc7bd

Fluoride in Water absorbs lead - Video 1:56 min

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=4bac4d2f0cfd9023

Is Bottled Water Safer Than Tap Water? - Video 3:10 min

http://www.ihealthtube.com/aspx/viewvideo.aspx?v=578c4c4601571d95

Is Fluoride Beneficial? 2:01 min

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 2:34 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Fw: Fluoride Follies: Six-Year-Old Protests Fluoride. Mayor Says "Great Job." Issue Dismissed.

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://blog.fluoridefreeaustin.com/2012/03/02/six-year-old-protests-fluoride-mayor-says-great-job-issue-dismissed-as-usual.aspx

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 3:04 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: gatekeeper-who-is-philip-huang

Please enter this information for consideration in your report to Council on the fluoridation issue.

Talk about connections!

http://blog.fluoridefreeaustin.com:80/2011/12/28/gatekeeper-who-is-philip-huang.aspx

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 3:14 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Handling toxic dust during unloading in fluoridisation plant - Australian Bulk Handling Review

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://www.bulkhandling.com.au:80/news/print-editions/sep-oct-print-edition/handling-toxic-dust-during-unloading-in-fluoridisation-plant

From: Janet Cooper [mailto:jlcooper@osmh.on.ca]
Sent: Friday, March 30, 2012 3:15 PM
To: Clerks Internet Email; cwf@smdhu.org
Subject: letter for support of fluoridation

Please see attached letter

hospital ORILLIA SOLDIERS' MEMORIAL

Mar 29/12

Dear Mayor Orsi and Council,

The Diabetes Education Centre of Orillia Soldiers' Memorial Hospital offers its support for the fluoridation of the municipal water supply.

Many of our clients face economic, physical, mental and social challenges which impact their self-care skills and limit there access to proper dental care.

Compromised dental health impacts diabetes control by restricting food choices as well as leading to infection related blood glucose elevations. Poorly controlled diabetes is well known to have increased risks of micro and macro vascular complications.
As such, any measures that help to maintain dental health are relevant to minimizing our clients' risk of developing diabetes complications.

Fluoridation of the municipal water supply will help to protect some of our most vulnerable clients.

Sincerely,
Janet Cooper RD, CDE
Coordinator of the Adult Diabetes Education Centre
Orillia Soldiers' Memorial Hospital

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 3:23 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Pew Children's Dental Campaign - The Pew Center on the States

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://www.pewcenteronthestates.org/initiatives_detail.aspx?initiativeID=42360

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 3:19 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Unfluoridate It! The Council Of Canadians

Please enter this information for consideration in your report to Council on the fluoridation issue.

http://canadians.org/water/issues/fluoride/index.html

From: dianne orton [mailto:diniii@distributel.net]
Sent: Thursday, March 29, 2012 3:27 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Emailing: Looking to Save Money, More Places Decide to Stop Fluoridating the Water - NYTimes.com

Looking to Save Money, More Places Decide to Stop Fluoridating the Water

MIAMI — A growing number of communities are choosing to stop adding fluoride to their water systems, even though the federal government and federal health officials maintain their full support for a measure they say provides a 25 percent reduction in tooth decay nationwide.

Last week, Pinellas County, on Florida's west coast, voted to stop adding fluoride to its public water supply after starting the program seven years ago. The county joins about 200 jurisdictions from Georgia to Alaska that have chosen to end the practice in the last four years, motivated both by tight budgets and by skepticism about its benefits.

Eleven small cities or towns have opted out of fluoridating their water this year, including Fairbanks, Alaska, which acted after much deliberation and a comprehensive evaluation by a panel of scientists, doctors and dentists. The panel concluded that in Fairbanks, which has relatively high concentrations of naturally occurring fluoride, the extra dose no longer provided the help it once did and may, in fact, be harmful.

It is a view that also was shared by four out of seven commissioners in Pinellas County who first raised the proposal as a cost cutting measure.

"I'm in opposition to putting a medical treatment into the public drinking water supply without a vote of the people who drink that water," said Norm Roche, a newly elected Republican county commissioner who spent 10 years doing policy research for the county Water Department and who led the turnaround effort. "We had a dozen to 15 doctors, dentists, dental hygienists and chemists here who want us to continue this practice but who could not agree themselves on how best to use fluoride."

Some 700,000 people — 75 percent of the county — will be affected by the vote. The rest receive water from a different source.

But the United States Public Health Service and the Centers for Disease Control and Prevention say that the communities that stop adding fluoride to the water supply are misguided. The government continues to recommend the practice, which began in the 1940s and has had its share of recent successes, including San Diego's move to fluoridate water this year after a long delay. Some 72 percent of the population in the country drinks water with added fluoride.

Keeping fluoride in water is especially important today because many people cannot afford dental care, public officials say.

"We have had big wins and significant losses," Dr. William Bailey, chief dental officer for the Public Health Service and acting director for the Centers for Disease Control and Prevention's division of oral health, said

about the skirmishes over fluoridation. “Fluoridation helps people of all ages and income groups. And it helps people who can’t get in to receive care.”

The movement to stop fluoridating water has gained traction, in large part, because the government has recently cautioned the public about excessive fluoride. A report released late last year by the Centers for Disease Control and Prevention linked fluoride to an increase among children in dental fluorosis, which causes white or yellow spots on teeth. About 40 percent of children ages 12 to 15 had dental fluorosis, mostly very mild or mild cases, from 1999 to 2004. That percentage was 22.6 in a 1986-87 study.

Fluorosis is mostly a cosmetic problem that can sometimes be bleached away. But critics argue that spotted teeth are a warning that other bones in the body may be absorbing too much fluoride. Excessive fluoride can lead to increases in bone fractures in adults as well as pain and tenderness.

“Teeth are the window to the bones,” said Paul Connett, a retired professor of environmental chemistry and the director of the Fluoride Action Network, which advocates an end to fluoridated water.

Experts say that one possible factor in this increase may be that fluoridated water is consumed in vegetables and fruit, and juice and other beverages as well as tap water. And the consumption of beverages continues to increase.

In January, the federal Department of Health and Human Services recommended reducing the fluoride put into the water supply to 0.7 milligrams per liter of water. The longtime standard had ranged from 0.7 to 1.2 milligrams per liter. At the lowest level, the risk of fluorosis is decreased, the government says.

The government also informed parents of infants who exclusively use infant formula reconstituted with fluoridated water that their children face an increased risk of fluorosis and suggested they use low-fluoride water, like distilled water, some of the time. “It was a trigger,” said Mr. Connett. “People who had heard there is nothing wrong with fluoridation all of the sudden are hearing that kids are getting too much fluoride.”

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of wrighca@rogers.com
Sent: Thursday, March 29, 2012 10:39 PM
To: JASON COVEY
Subject: fluoridation of orillia water

Natural fluoride is found in our natural unprocessed vegies, soya etc.
Europe & North America have fluoride tablets tha one can purchase for themselves without forcing others against fluoride.

Skin is out largest organ. We drink 8-10 glass water everyday(the health dept. recommends).
We shower - Fluoride water is absorbed into skin and lungs through steam. We soak in bath and children play for quite a few minutes in tub absorbing even more fluoride.
Our cars, lawns and flower & vegies will get a fluoride treatment.
We get fluoride in toothpaste, and some mouth wash.
Every week I read the local paper City of Orillia is cutting back financial healp here, there, dur to not enough money.
WELL - it is going to cost thousands of dollars to refit water system and thousands to buy the fluoride.
Fluoride is not good for the thyroid, hypothalmus causing fat people.
WHO BENEFITS
The company selling fluoride as the have to make-up $ lost due to the smart other communities who cancelled fluoride and the companie's shore holders expect profit.
The medical profession as there will be more illness.
Diet products & exercise studies which will not work because the organs have been effected.
I City of Orillia insists on denying one freedom then give us that say NO to Fluoride reverse osmosis or distillation systems (their choice) to eliminate most of the fluoride.
If the City puts the fluoride in the water then we all know the City of Orillia accepted the silver tray with the pot of honey offered by the lobbyists.
Please educate yourselves and read "The Fluoride Deption" by Christopher Bryson by Seven Stories Press.

Thank you.
Carole Wright

From: M Else [mailto:simcoeregionchapter@live.ca]
Sent: Thursday, March 29, 2012 9:27 PM
To: *Steve Goulter Orillia member; MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; charles.gardner@smdhu.org; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Subject: RE: FYI: Quantites of HFSA, Arsenic and Lead get dumped into our lakes...

Dear Steve Goulter

You are certainly right about all your research - The Council of Canadians is 100% with you - and we will do everything to spread this insane proposal by the City of Orillia - it means MEDICATING PEOPLE WITHOUT THEIR CONSENT.....

Many blessings from Marianne
Contact person for the Simcoe Region Chapter of the Council of Canadians

http://www.facebook.com/pages/Council-of-Canadians-Simcoe-Region-Chapter/199212250127335?sk=wall

simcoeregionchapter@live.ca http://www.youtube.com/user/simcoeregionchapter http://www.facebook.com/group.php?gid=183316441007

Please let us know if you prefer not to receive notices - just send an email with DELETE in the subject line. Thank you so much for your attention.
and Please consider the environment before printing this email.

From: goulter255@hotmail.com
To: mayor@orillia.ca; linda.murray170@gmail.com; andrew.hill@bell.net; pat@kehoeassociates.ca; pcvc@sympatico.ca; petebowen12@gmail.com; tonymadden@rogers.com; pdance@orillia.ca; charles.gardner@smdhu.org; bill.mindell@smdhu.org; mfogarty@bell.blackberry.net; jcovey@orillia.ca
Subject: FYI: Quantites of HFSA, Arsenic and Lead get dumped into our lakes
Date: Thu, 29 Mar 2012 18:55:45 -0300

TO WHOM IT MAY CONCERN - -ie, ALL OF US!

I have been trying to quantify the quantities of toxic substances that would be "DUMPED" into the lake IF the town of Orillia were to go ahead with fluoridation of the city water supply, as they are proposing. See the attached for details of the calculations.

I summarize the data here;

TOTAL ANNUAL DISPOSAL OF HEXAFLUOROSILICIC ACID (HFSA) INTO LAKE;

88 forty-five gallon drums (or 3960 US gallons or 15,000 litres, or 40,000 pounds)!

..... Yes, one semi-trailer with maximum load!

No, they will not be using "FLUORIDE", like in your toothpaste - this HFSA is toxic waste from the manufacture of fertilizer - every bit as toxic as arsenic and mercury! And it is "Commercial" grade, not pharmaceutical grade, not regulated or controlled by anyone.

This much HEXAFLUOROSILICIC ACID could contain;

----- ARSENIC: from 3.5 to 56 US gallons

LEAD: from "nil" to 3.6 US gallons

..... based on the batch parameters for each barrel - vary a lot!

..... and could contain up to 300 other chemicals!

I know, this is so hard to believe, that I have put off the release of this data 'till now, checking and double checking the numbers.

To "DUMP" this much toxic waste into our ECO-SYSTEM is ABSOLUTELY INSANE! ..... and for what, supposedly a few less dental cavities?

This has nothing to do with less cavities, it is all about TOXIC WASTE DISPOSAL! North America even buys some HFSA from CHINA (they won't use it in this way - SMART!)

I plan to disseminate this data to every ENVIRONMENTAL group in the region ASAP!

Please DO NOT DO THIS!

PLEASE SAY "NO" TO FLUORIDATION!

Please, everyone, help to stop this!

Steve Goulter, MSc

From: Heather Gingerich [mailto:medical.geologist@gmail.com]
Sent: Thursday, March 29, 2012 5:17 PM
To: JASON COVEY
Subject: Fluoridation Consultation Submission

Hello Jason!

Great to meet you last week and thanks again for giving us so much of your time.

Attached is an excerpt from the 2010 United Nations publication that outlines the position of the International Medical Geology Association on artificial water fluoridation (please not that Canada is one of the few countries in the world that fluoridate) and a professional statement from Dr. Hardy Limeback (Head of Preventive Dentistry, University of Toronto). Here are some links to recent publications on the subject that I have written since I've assumed Directorship of the Canadian chapter and a few links on non-dental health effects for Dr. Garner's consideration.

Environmental Effects and Considerations
http://mediaedge.imirus.com/Mpowered/book/vwn2011/i2/p1
My commentary starts on page 8.

http://www.peaceoperations.org/wp-content/uploads/2010/02/PearsonPapersVol12_WEB.pdf
My article begins on page 27.

Osteosarcoma
http://www.fluoride-info-service.net/fluoridegatenz/documents/crown_legal_liability.pdf

Infant Formula
Here is the link to the Codex Alimentarius - the international nutritional sciences research body - where Fluoride is addressed in section 3.3 on page 8, stating unequivocally that F should not be added to infant formula.

http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cts=1331574543003&ved=0CDAQFjAA&url=http%3A%2F%2Fwww.codexalimentarius.net%2Fdownload%2Fstandards%2F288%2FCXS_072e.pdf&ei=8TZeT93ECqLs0gHFye2cBg&usg=AFQjCNHG9bvHR3FkJE3nYfkgarZbDzb5xg&sig2=Uern6Xs11QmuVRMfiLZxiQ

Here is a link to the National Academy of Science Dietary Reference Intakes for Fluoride - the **Adequate Intake for infants 0-6 months is 0.01 mg/day and the Upper Tolerable Limit is 0.7 mg/day**. If infants average 0.78 litres of feeds per day, that means that and "adequate" F concentration from water alone (i.e. not including any F from the formula powder) is 0.0128 mg/L and the Upper Limit is 0.9 mg/L.

Therefore, if the WUC adds fluorosilicates to the water supply to a level of say, 0.65 mg/L, then infant formulas are already exceeding the adequate intake that would be provided by breastmilk at 0.013 mg/L by 50 times and they are rapidly approaching the Upper Tolerance Level **without having added any formula powder or concentrate**.

http://www.iom.edu/Activities/Nutrition/SummaryDRIs/~/media/Files/Activity%20Files/Nutrition/DRIs/5_Summary%20Table%20Tables%201-4.pdf

Here is a link to the National Academies Press that indicates that F in the powdered

portion of formula would result in a concentration of feeds that ranges from 0.14 - 0.24 mg/L F **before any water has been added**.

http://www.nap.edu/openbook.php?record_id=11571&page=36

Health Canada very irresponsibly dodges the issue by not breaking down the infant formula data in ***Table B-3: Estimated dietary intake of fluoride by infants as a function of fluoride level in their community drinking water and the type of formula fed to them*** on page 95 of the 2010 Review. I have attached an Excel spreadsheet that does the math for infants up to 6 months of age but I am concerned that Health Canada used the lower range of possible infant formula powders from Dabeka et al. 2007 and so, besides making the table incomprehensible for the general public, they are also underestimating the Worst Case Scenario.

When I pointed the inconsistencies out to a Health Canada staffer in the Drinking Water Standards branch and asked why community drinking water standards were not set to protect formula-fed infants, the answer was "because they represent such a small proportion of the general population" - never mind that 100% of the population passes through infancy at some point.

So, as you can see, there is absolutely no scientific support for the addition of fluoridated water to infant formula. In fact, the practice is presented as being patently dangerous for that segment of our society that is most vulnerable..

I hope this helps you protect the wee ones in your community,
Heather

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http://medicalgeology.org

"Do not be daunted by the enormity of the world's grief. Do justly, now. Love mercy, now. Walk humbly, now. You are not obligated to complete the work, but neither are you free to abandon it." (from the Torah)

From: Heather Gingerich [mailto:medical.geologist@gmail.com]
Sent: Thursday, March 29, 2012 5:44 PM
To: JASON COVEY
Subject: Fluoridation Consultation Submission - Lake Simcoe Protection Act

Hello again, Jason!

I almost forgot about the Lake Simcoe Protection Act (2008)
http://www.e-laws.gov.on.ca/html/source/regs/english/2009/elaws_src_regs_r09219_e.htm

This is significant because the Canadian Water Quality Guidelines for the Protection of Aquatic Life set by Environment Canada is 0.12 mg/L. Therefore, artificial water fluoridation is in violation of at least 3 pieces of federal legislation, namely;

1) the Species At Risk Act (2002)
2) the Canadian Environmental Protection Act (1999), and
3) various pieces of legislation stemming from the Fisheries Act (1985)

Have a great weekend!
Heather

--
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"Do not be daunted by the enormity of the world's grief. Do justly, now. Love mercy, now. Walk humbly, now. You are not obligated to complete the work, but neither are you free to abandon it." (from the Torah)

To whom it may concern: Nov. 15, 2011

Let me draw your attention to the National Academy of Sciences: Toxicological Risk of Fluoride in Drinking Water, 2006

Our report on the toxicity of fluoride and the health effects of its use in drinking water was published March 22, 2006 and can be found online at http://www.nap.edu/catalog.php?record_id=11571

Our committee was funded by the US EPA – we did not examine the benefit of fluoridation but we certainly **reviewed all relevant literature on the toxicity of fluoride, including those at low levels of intake, and the effects of fluoridation.**

It has taken more than 5 years for the EPA to respond to our report. It now acknowledges that fluoride in drinking water poses a problem and it has lowered its recommendation for levels of fluoride in drinking water to 0.7 mg/L (ppm).

The American Dental Association and the Center for Disease Control in the US both agree that fluoridated tap water should not be used to make up infant formula, since that increases the risk of dental fluorosis.

To me, dental fluorosis is a biomarker for fluoride poisoning. **Health Canada, taking the recommendation of only pro-fluoridation experts, failed to come up with the same warnings** as in the USA but then Health Canada does not set fluoridation policy. Neither do the provinces. Municipalities set policies such as water fluoridation.

As far as I know, **Public Health Officials have made no effort to inform expectant mothers and mothers of newborn babies to avoid using fluoridated city tap water for making up infant formula. Their inaction is regrettable**.

A bone study, for which we received national funding, comparing hip bones of people who live in Toronto (fluoridated since 1963) to the bones of people from Montreal (Montreal has never been fluoridated), suggests disturbing negative changes in the bone quality of Torontonians (see attached). This is NOT GOOD.

Since we studied a cross section of the population as they were selected for hip replacement, we were unable to examine only those people who were exposed to fluoridation for a lifetime. If we had been able to do this, we would have seen a much greater negative effect of fluoride since fluoride accumulates with age (our study confirmed that).

Studies like ours indicate that not only does extra fluoride in the water cause defective enamel (that is VERY expensive to treat) but also defective bone.

The NAS committee examined the literature on the effects of fluoride on bone up until 2006. Since that time there have been more studies to confirm the link between fluoridation and bone changes, as well as a link to bone cancer.
Our Toronto vs Montreal study was not included in the 2006 review by the US National Academies of Sciences because it only just got published in 2010.

Fluoride has NOT been shown to be safe and effective. In fact, as more and more peer-reviewed studies on fluoride toxicity appear in the literature, it has become clear to me that the pendulum is certainly shifting to 'Not safe, and no longer effective'.

Our 2006 NRC (NAS) report also concluded that there is likelihood that fluoride can promote bone cancer. On page 336 it is stated *Fluoride appears to have the potential to initiate or promote cancers, particularly of the bone, but the evidence to date is tentative and mixed (Tables 10-4 and 10-5).*
This alone should force the EPA to set a fluoride maximum contaminant level goal for fluoride in drinking water at ZERO (as it did for arsenic).
The EPA has not yet made a decision as to fluoride's carcinogenicity.

I have looked at this from all angles and I have to conclude that:

- **fluoridated cities would save money on fluoridation costs**
- **parents would save on costly dental bills treating dental fluorosis**
- **dental decay rates would remain unchanged or even continue to decline (as has been demonstrated in many modern fluoridation cessation studies) and**
- **the health of city residents would improve when industrial waste products are no longer added to drinking water.**

I find it absurd that industrial toxic waste is shipped to the water treatment plants in large tanker trucks and trickled into the drinking water of major cities in North America.
This not only puts water fluoridation employees at risk for serious injury, but if a major spill should occur, releasing the highly corrosive and poisonous hydrofluosilicic acid into the atmosphere, people's lives would be at stake.

Individual municipalities set fluoridation policies. That means that the city is responsible for the practice of fluoridation (and thus are primary targets for litigation when those class action lawsuits start to emerge) .

I could not find anywhere in the Fluoridation Act of Ontario (see http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90f22_e.htm) that states that cities have to provide alternatives to water fluoridation should city councils decide to halt the practice.

Several Canadian cities have decided it is not worth continuing the practice of fluoridation. Recently Quebec City decided to halt fluoridation. So did Waterloo and Calgary.

There is no doubt in my mind that fluoridation has next to no benefit in terms of reduced dental decay.
The modern literature (NRC 2006 report) is clear on that. Fluoridation cessation studies fail to show an increase in dental decay. In fact, caries rates continue to drop.

Since fluoride intake delays tooth eruption, water fluoridation studies that do not make a correction for that are flawed. The York reviewers recognized this problem. Even the York review is flawed because

of this. Additionally, in their systematic review, the York reviewers made a grave error in estimating benefits by lumping modern studies with very old studies when decay rates were a lot higher.

In the 1950's, when fluoridation started to catch on, it was claimed that there was as much as a 40% benefit. Despite the evidence being very weak, fluoridation might have been worthwhile, especially since fluoridated toothpastes were not introduced until the late 1960's. After that, the benefit of fluoridation declined.

Now, if there is any benefit at all, one could expect perhaps a 5-10% benefit in children. If half the children are already cavity free and the average decay rates are only two cavities per child it means cities have to fluoridate for 20 years in order to save one decayed surface for every fifth child.

Clearly, that is NOT a policy that demonstrates fiscal responsibility and cities that do not do due diligence in terms of cost-benefit analysis are wasting tax payers money and may actually be putting their councillors in a position of liability.
The claim that for every $1 spent on fluoridation saves $38 was never accurate and is currently exceedingly misleading. It simply is a lie.

The following is a formal discussion (deposition) of the above with proper citation of the peer-reviewed scientific literature.
This literature cited is not junk science, as claimed by fluoridation promoters.

Sincerely

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STATEMENT BY DR. HARDY LIMEBACK

I would like to outline my arguments that fluoridation is ineffective and a harmful public health policy.

1. Fluoridation is no longer effective

Fluoride in water has the effect of delaying tooth eruption and, therefore, simply delays dental decay (Komarek et al, 2005, Biostatistics 6:145-55).

The studies that water fluoridation works are over 25 years old and were carried out before the widespread use of fluoridated toothpaste.

There are numerous modern studies to show that there no longer is a difference in dental decay rates between fluoridated and non-fluoridated areas, a recent one in Australia (Armfield & Spencer, 2004 Community Dental Oral Epidemiology. 32:283-96).

Recent water fluoridation cessation studies show that dental fluorosis (a mottling of the enamel caused by fluoride) declines but there is no corresponding increase in dental decay (e.g. Maupome et al 2001, Community Dental Oral Epidemiology 29: 37-47).

Public health services will claim there is still a dental decay crisis. **With the national average in Europe of only two decayed teeth per child (World Health Organization data), down from more than 15 decayed teeth in the 1940s and 1950s before fluoridated toothpaste, as much as half of all children grow up not having a single filling.**
This remarkable success has been achieved in most European countries without fluoridation.

The "crisis" of dental decay often mentioned is the result, to a major extent, of sugar abuse, especially soda pop. A 2005 report by Jacobsen of the Center for Science in the Public Interest said that U.S. children consume 40 to 44 percent of their daily refined sugar in the form of soft drinks. Since most soft drinks are themselves fluoridated, the small amount of fluoride is obviously not helping.

The families of these children with rampant dental decay need professional assistance. It appears they are not getting it. Children who grow up in low-income families make poor dietary choices, and cannot afford dental care. Untreated dental decay and lack of professional intervention result in more dental decay. **The York review was unable to show that fluoridation benefited poor people to any greater extent than other groups of the population**.

The York review, and others that followed, including the Systematic Review of the Efficacy and Safety of Fluoridation conducted recently in Australia
http://www.nhmrc.gov.au/publications/synopses/eh41syn.htm
and **Health Canada's review of fluoridated water** http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php **failed to identify even one double-blinded, randomized prospective clinical trial to prove the fluoridation works, after correcting for diet and delay in tooth eruption.**

This means that the reviewers failed to show the level of evidence for efficacy that is required in North America for a medicine to be approved.

Furthermore, most reviews admit that there is not enough evidence for safety, since properly conducted clinical trials were not designed to measure adverse health effects.

None of the reviews conducted to date addressed whether fluoridation can reduce the prevalence or severity of early dental decay in nursing infants (baby bottle syndrome). A very large percentage of dentists in North America do not accept patients on government assistance because they lose money treating these patients.
In my experience, many dentists support fluoridation because it supposedly absolves them of their responsibility to provide assistance to those who cannot afford dental treatment. Even cities where water fluoridation has been in effect for years are reporting similar dental "crises."

In my opinion, Public health officials responsible for community programs **are misleading the public by stating that ingesting fluoride "makes the teeth stronger."**

Fluoride is not an essential nutrient. It does not make developing teeth better prepared to resist dental decay before they erupt into the oral environment.

The small benefit that fluoridated water might still have on teeth (in the absence of fluoridated toothpaste use) is the result of "topical" exposure while the teeth are rebuilding from acid challenges brought on by daily sugar and starch exposure (Limeback 1999, Community Dental Oral Epidemiology 27: 62-71), and this has now been recognized by the Centers for Disease Control.

2. Fluoridation is the main cause of dental fluorosis

Fluoride doses by the end user can't be controlled when only one concentration of fluoride (1 parts per million) is available in the drinking water.

Babies and toddlers get too much fluoride when tap water is used to make formula (Brothwell & Limeback, 2003 Journal of Human Lactation 19: 386-90).

Since the majority of daily fluoride comes from the drinking water in fluoridated areas, the risk for dental fluorosis greatly increases (National Academy of Sciences: Toxicological Risk of Fluoride in Drinking Water, 2006).

The American Dental Association and the Dental Forum in Ireland have admitted that fluoridated tap water should not be used to reconstitute infant formula.

We have tripled our exposure to fluoride since fluoridation was conceived in the 1940s. This has lead to every third child with dental fluorosis (CDC, 2005).

Fluorosis is not just a cosmetic effect.

The more severe forms are associated with an increase in dental decay (NAS: Toxicological Risk of Fluoride in Drinking Water, 2006) and the psychological impact on children is a negative one.

Most children with moderate and severe dental fluorosis, the prevalence of which is higher in fluoridated areas and is not insignificant in terms of proportions of the population affected, seek extensive restorative work costing thousands of dollars per patient.
Dental fluorosis can be reduced by turning off the fluoridation taps without affecting dental decay rates (Burt et al 2000 Journal of Dental Research 79(2):761-9).

3. Chemicals that are used in fluoridation have not been tested for safety

All the animal cancer studies were done using sodium fluoride. There is more than enough evidence to show that even this form of fluoride has the potential to promote cancer because it accumulates in the bone and produces levels that are high enough to induce cancer (NAS: Toxicological Risk of Fluoride in Drinking Water, 2006).

Some communities use sodium fluoride in their drinking water, but even that chemical is not the same fluoride added to toothpaste.
Most cities instead use hydrofluorosilicic acid (or its salt). H_2SiF_6 is concentrated directly from the smokestack scrubbers during the production of phosphate fertilizer, shipped to water treatment plants and trickled directly into the drinking water.
It is industrial grade fluoride contaminated with trace amounts of heavy metals such as lead, arsenic and radium, which are harmful to humans at the levels that are being added to fluoridate the drinking water.

In addition, **using hydrofluorosilicic acid instead of industrial grade sodium fluoride has an added risk of increasing lead accumulation in children** (Masters et al 2000, Neurotoxicology. 21(6): 1091- 1099), probably from the lead found in the pipes of old houses.
This could not be ruled out by the CDC in their recent study (Macek et al 2006, Environmental Health Perspectives 114:130-134).

None of these issues have ever been addressed by the various government sponsored reviews.

4. There are serious health risks from water fluoridation.

Cancer:

Osteosarcoma (bone cancer) has been identified as a risk in young boys in a recently published Harvard study (Bassin, Cancer Causes and Control, 2006).

The author of this study, **Dr. Elise Bassin, acknowledges that perhaps it is the use of these untested and contaminated fluorosilicates mentioned above that caused the over 500% increase risk of bone cancer in young boys.**

The long-awaited study published by her former PhD supervisor (Dr. Chester Douglass) in no way negated these findings.

The NAS committee was unsure about designating fluoride as a potential carcinogen in 2006 because we wanted to wait for the final study from the Harvard group. Now that it is published, nothing has changed (Kim FM et al. 2011, J Dent Res. 90(10):1171-6).

Bone fracture:

Drinking on average 1 liter/day of naturally fluoridated water at 4 parts per million increases your risk for bone pain and bone fractures (National Academy of Sciences: Toxicological Risk of Fluoride in Drinking Water, 2006).

Since fluoride accumulates in bone, the same risk occurs in people who drink 4 liters/day of artificially fluoridated water at 1 part per million, or in people with renal disease.

Additionally, Brits are known for their tea drinking and since tea itself contains fluoride, using fluoridated tap water puts many heavy tea drinkers dangerously close to threshold for bone fracture.

Our recently published study on fluoride in bone from fluoridation (Chachra et al, J Dent Res 89(11):1219-1223, 2010) shows a negative trend in changes that have occurred in the bone of Torontonians who have lived only a portion of their lives in fluoridated Toronto.

Fluoridation studies have never properly shown that fluoride is safe in individuals who cannot control their dose, or in patients who retain too much fluoride.

Adverse thyroid function:

Our National Academy of Sciences report (NAS: Toxicological Risk of Fluoride in Drinking Water, 2006) outlines in great detail the detrimental effect that fluoride has on the endocrine system, especially the thyroid.

Fluoridation should be halted on the basis that endocrine function has never been studied in relation to total fluoride intake.

Adverse neurological effects:

In addition to the added accumulation of lead (a known neurotoxin) in children living in fluoridated cities, fluoride itself is a known neurotoxin.

We are only now starting to understand how fluoride affects the brain. Several recent studies suggest that fluoride in drinking water lowers IQ (NAS, 2006).
We need to study this more in depth.

In my opinion, having served on the NAS Committee in the US for more than 3 years, the evidence that fluoridation is more harmful than beneficial is now overwhelming and cities that avoid thoroughly considering ALL the recent data do so, in my opinion, at risk of future legal action.

Dr. Hardy Limeback PhD, DDS
Professor and Head, Preventive Dentistry University of Toronto

Medical Geology

A Regional Synthesis

Olle Selinus
Robert B. Finkelman
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International Union of Geological Sciences

Springer

Medical Geology Issues in North America

Robert B. Finkelman, Heather Gingerich, Jose A. Centeno, and Gary Krieger

Abstract To a larger degree than most others, North Americans are shielded from the natural environment. Nevertheless, health problems caused by geologic materials and geologic processes do occur in North America. In contrast to the acute health problems caused by the geologic environment in developing countries, in North America these health concerns are more likely to be chronic, caused by long-term, low-level exposures. Among the potential health concerns that have received public health attention are exposure to trace elements such as fluorine, arsenic, and radon; exposure to natural mineral dusts; occupational and community exposures to trace elements; and ingestion of naturally occurring organic compounds in drinking water. This chapter provides North American examples of each of these environmental health problems and suggestions how the earth sciences can be an integral part of multi-disciplinary teams working to mitigate these problems.

Keywords United States · Canada · Fluorosis · Cancer · Asbestos · Black lung disease · BEN · Organic compounds · Radon · Arsenic · Diabetes · Fluorine

Introduction

To a larger degree than most other people, North Americans are shielded from the natural environment. North Americans commonly live, work, and travel in air-conditioned environments; in supermarkets they purchase foods grown all over the world; most drink municipal water that has been purified; and many take daily vitamins to supplement dietary deficiencies. Despite this shielding from the natural environment, health problems caused by geologic material and geologic process do occur in North America. In contrast to the acute health problems caused by the geologic environment in developing countries, in North America these problems are generally chronic, caused by long-term, low-level exposures.

There is a rich medical geology history in North America dating back to 1792 when John Rouelle described the medicinal properties of mineral water in Virginia (Rouelle, 1792). The 1970s enjoyed a renaissance marked by the appearance of a series of publications focused on the impacts of trace elements on human health. These publications included Geological Society of America (GSA) Memoir 123 (Cannon and Hopps, 1971); GSA Special Paper 140 (Cannon and Hopps, 1972); Annals of the New York Academy of Sciences Volume 199 (Hopps and Cannon, 1972); U.S. Geological Survey Professional Paper 574-C (Shacklette et al., 1970); GSA Special Paper 155 (Freedman, 1975); and National Research Council (1979).

Changes in staffing and priorities resulted in a hiatus in North American medical geology activities from the 1980s until the mid-1990s. The past decade has seen a resurgence of interest in medical geology evidenced by the inclusion of human health issues in the USGS Strategic Plan (U.S. Geological Survey, 2007), the formation of GSA's Geology and Health Division, and strong North American leadership and representation in the International Medical Geology Association.

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With contributions by Geoff Plumlee on Evolving Concerns about Asbestos and A Growing Role for Earth Sciences in Environmental Disaster Response and Planning.

O. Selinus et al. (eds.), *Medical Geology*, International Year of Planet Earth,
DOI 10.1007/978-90-481-3430-4_1,

This chapter is not intended to be a compendium of geology and health issues in North America. Rather, our objective is to highlight some of the more prevalent issues such as exposure to selected trace elements, dust, naturally occurring organics, and occupational health issues providing both historical and current examples of heath issues caused by geologic materials.

With renewed interest in the links between geology and health, natural elemental hazards are an important consideration in the rural areas as well as the densely populated urban centers of North America where cumulative, low-dose, and long-term exposures can lead to some of the chronic illness that consumes moderate percentages of the national incomes (as GDP) of the United States (15.9%), Canada (9.7%), and Mexico (6.7%), respectively (*The Economist*, July 19, 2007).

Trace Element Exposure

One of the major themes of the geology and health story involves acquiring an understanding of the consequences of both natural and perturbed cycling of elements between and within the lithosphere, the atmosphere, the hydrosphere, and the biosphere. In some cases, human settlement on our increasingly crowded landscape has expanded to include environments that are "naturally impaired" by either an over-abundance or a deficiency of elements relative to human and animal biological requirements.

Where elemental exposures create toxicity, safeguarding health becomes a matter of finding the "point(s) of intervention" in the Source–Path–Trap relationship, whether it be in air, water, earth materials or the food chain, and adapting appropriately to the natural environment in sustainable ways. In other instances, the challenge is to distinguish natural elemental occurrences, which we generally can only avoid through awareness, from "anthropogenic overprinting." Naturally occurring elements such as fluorine, radon, and arsenic have had variable impacts on different communities in North America as a function of route of exposure and dose. For example, US EPA considers that radon, "... is the leading cause of lung cancer among non-smokers. Radon is the second leading cause of lung cancer in America and claims about 20,000 lives annually." (http://www.epa.gov/radon/). Similarly, naturally occurring arsenic levels in ground water sources can be a significant issue in many parts of the United States especially in the western mountain regions where ground water levels often exceed regulatory standards (http://www.epa.gov/safewater/arsenic/index.html).

Fluorine

Owing to its extensive use in preventive dentistry in the post-World War II era, fluorine (F), which is commonly referred to as its ionic form, *fluoride*, is one of the most familiar and controversial elements of the Periodic Table. Safe, responsible, and sustainable use of fluorides is dependent on decision makers (whether they be politicians or parents) having a firm grasp on three key principles: (i) fluorine is not so much "essential" as it is "everywhere," (ii) recent human activities have significantly increased fluorine exposures to the biosphere, and (iii) fluorine has biogeochemical effects beyond bones and teeth.

Some of the fluorine that is ingested, imbibed, inhaled, or absorbed through the skin is excreted via the kidneys after having spent time in the circulatory system (WHO, 1997), whereas the balance is integrated into the body's mineralized tissues of teeth, bone (Ledbetter et al., 1960), the pineal gland (Luke, 2001), and sometimes as constituents of calculi or "stones" in the kidney, gallbladder, and tonsils. The easily identified and irreversible cosmetic, and sometimes structural, damage of *dental fluorosis* (Fig. 1) is caused by ingestion of excessive fluoride prior to the eruption of the tooth through the gum-line in childhood (Ruan et al., 2007). *Skeletal fluorosis* mimics a host of osteological disorders, including osteoarthritis and osteoporosis, and primarily affects adults in middle age although earlier incidence can occur in severe cases (Skinner, 2005). The full range in dysfunction associated with *systemic fluorosis* is still not well understood, although research has found correlations with thyroid disorders (National Research Council, 2006), certain cancers (Bassin et al., 2006), and deleterious effects on the brain (Mullenix et al., 1995).

Fluorine is ubiquitous in the natural environment. At the atomic level, fluorine is not only the 14th most abundant element in the Earth's crust –more abundant than any other halogen and even the "Basic Building Block of Life", carbon (C) –but also supremely reactive and oxidative, with the highest Pauling value

for electronegativity of 4.0 and an unusually low dissociation energy, which means that it has the tendency to "steal" electrons from most other elements or at least "share" them by forming strong bonds. The fluoride ion (F^-) has a charge of (–1) and a similar ionic radius (1.33 Å) to that of the anions of oxygen (O^{2-}, 1.40 Å) and the hydroxyl group (OH^-, 1.32 Å), but being so much more electronegative, it often substitutes for the hydroxyl group in mineral complexes and increases the stability of the crystal lattice structure. The resulting resistance to dissolution in acid of fluoroapatite as compared with hydroxylapatite is the basis of fluoride's use in preventive dentistry.

Earth materials that are characteristically rich in fluorine are organic clays and shales, carbonatites, phosphates, hydrothermal ores, and silicic igneous rocks like rhyolites, dacites, and granites –especially the Rapakivi and alkali type (Boyle, 1976). In short, every geologic environment in the lithosphere –igneous, metamorphic, sedimentary –contains fluorine, though the amount that is bioavailable can vary considerably.

By volume, the greatest amount of naturally occurring fluorine in the atmosphere occurs as HF gas related to volcanic activity. Fluoride also regularly makes its way into the atmosphere as marine aerosols and by the diffusion from the surface of the water-soluble fluoride mineral *fluorite* (CaF_2), which is common to the non-volcanic subsurface environment of the Mississippi Valley of the United States and some parts of Ontario and Québec in Canada (Boyle, 1976).

Within the biosphere, plants appear to be relatively tolerant to high fluoride in groundwater and soils (Kabata-Pendias, 2001) and respond by accumulating this element in the leaves (which is why tea is a fluoride-rich foodstuff). While not obviously toxic to the plant itself, fluorine-laden particulates associated with volcanic activity can accumulate on forage materials that are ingested by herbivores and then concentrated along the food chain (Fleming et al., 1987).

Aside from the rare instances when one of North America's many active volcanoes like Mount St. Helen's or Popocatepetl erupts, drinking water is the primary route of fluoride exposure for individuals and communities. The average concentration of fluoride in seawater is 1.35 mg/l, but with the exception of alkali lakes, other surface waters and precipitation are generally naturally low in dissolved fluoride ion (0.01–0.3 mg/l), depending on atmospheric inputs and the geochemistry of the earth materials contacted (Edmunds and Smedley, 2005). Groundwater, on the other hand, can vary tremendously with respect to fluoride content.

Dental Fluorosis: A Century of "Colorado Brown Stain"

Nestled at the foot of the Pikes Peak at the eastern end of the Rocky Mountain Chain, Colorado Springs at the turn of the last century was a breathtakingly beautiful, albeit challenging, first posting for the young dentist, Dr. Frederick McKay. Fresh out of dental school and far from his native Massachusetts, McKay was puzzled by the mottled and sometimes pitted appearance of many of his new patients' teeth, locally referred to as "Colorado Brown Stain" that reminded him of a phenomenon that was prevalent in the local population in St. Louis, Missouri, in the heart of the Mississippi River Valley, where he completed his training in orthodontia. Upon further investigation, it was found that 87.5% of surveyed school children that were born in the Pikes Peak region had some degree of what is now known as *dental fluorosis* that residents attributed to "something in the water." It was the Spring of 1909. (Paraphrased from the Pierre Fauchard Academy International Hall of Fame of Dentistry induction speech.) (Fig .1).

In 1931, US Public Health Service researcher Henry Trendley Dean concluded that the "something" that caused Colorado Brown Stain was naturally elevated levels of fluoride (F^-) in the local water supply, which

Fig. 1 *Colorado Brown Stain.* Dental fluorosis that would be classified as "moderate" on Dean's Index. All enamel surfaces of the teeth are affected, and the surfaces subject to attrition show wear. Brown stain is frequently a disfiguring feature that lasts for life. Source: Photo courtesy of Hardy Limeback

substituted for hydroxyl (OH^-) ions of similar size and charge in the apatite [$Ca_{10}(PO_4)_6(OH,F,Cl,Br)_2$] crystals of teeth. Looking at the geology of the Colorado Springs area, this is hardly surprising, as there are no less than three significant geogenic sources of fluoride in the environment. With meteoric waters of low ionic strength and slightly acidic pH cascading off the 1.1 billion year-old Rapakivi granites of the Pikes Peak Batholith, and at least two major mineralized faults (the Ute Pass and Rampart Range Faults) that are associated with the Laramide Orogeny (or mountain building event) 65 million years ago, fluoride from easily dissolved minerals would be picked up and concentrated all along the flow path. Being a black (organic-rich), and therefore also likely fluorine enriched, Cretaceous sedimentary unit deposited sometime over the last 65–145.5 million years, the Pierre Shale that underlies Colorado Springs would have contributed even more fluoride to the local water supply once it bubbled up through the network of fractures and fissures in the bedrock of the plateau (Fig. 2).

In the decades that followed, dental data have been instrumental in identifying fluoride-rich environments, as children are especially susceptible to developing the tell-tale sign of mottled teeth that they carry into adulthood due to high fluoride exposure relative to their low body weight during critical phases in enamel formation. H. Trendley Dean became the first director of the National Institute of Dental Research in 1948 and was able to identify several other geochemical environments that are associated with high naturally occurring fluoride resulting in adverse biological effects within the continental United States. Notable among them are the petroleum-rich Lone Star State which is home to "Texas Teeth" (a southern cousin of "Colorado Brown Stain"), the fault- and fracture-riddled bedrock that hosts the metal-sulfide ore deposits of the Upper Mississippi River Valley (noted by Frederick McKay during his time in St. Louis), the highly metamorphosed coal-bearing hills of Virginia, Maryland, and Pennsylvania along the eastern seaboard, and the phosphate-rich Florida Panhandle (Fig. 3).

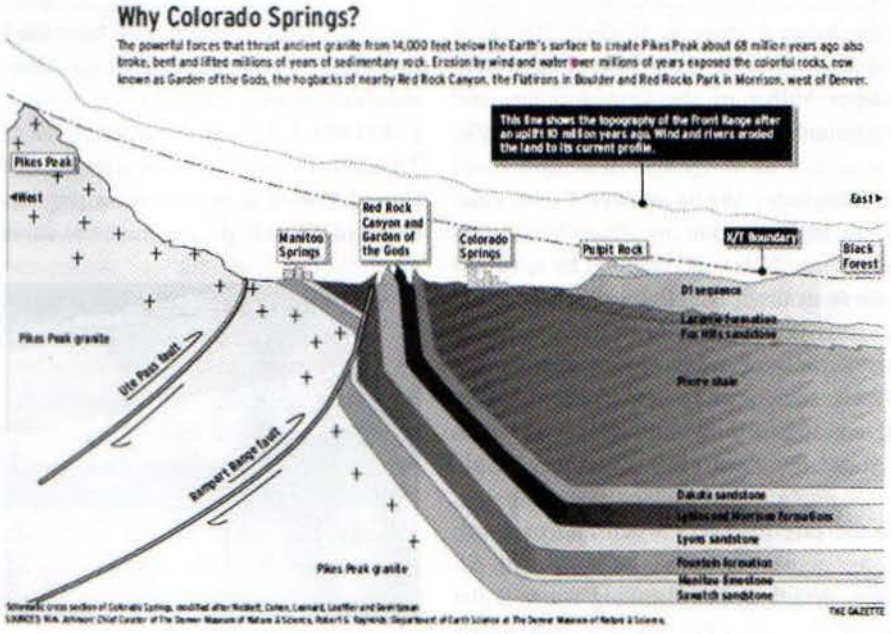

Fig. 2 *Geologic cross-section of the Pikes Peak area.* Clearly an environment that would be prone to the development of fluorosis in children with three natural sources of fluoride. Naturally occurring fluoride in the water supply of nearby Manitou Springs is reportedly in the 3.0–3.6 mg/L range. Source: From http://gazetteoutthere.blogspot. com/2007/07/colorado-springs-geology-rocks.html

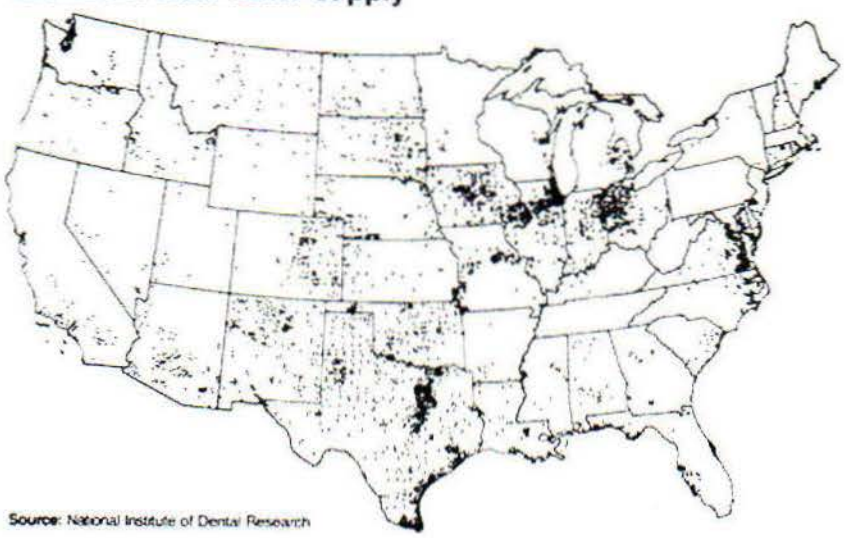

Fig. 3 Many US communities have 0.7 ppm or more natural fluoride in their water supply

Recent Human Activities Have Perturbed Natural Fluorine Cycling

While volcanic eruptions do not happen every day, and few people live in close proximity to an economically significant mineral deposit, the fluorine exposures of modern North American residents have increased dramatically since the end of World War II when industrial fluorine use became commonplace. Today, the primary sources of anthropogenic fluorine emissions include phosphate fertilizer production, aluminum and magnesium smelting, coal burning, oil refining, steel production, chemical production, primary copper and nickel production, clay production, lead and zinc smelting, glass and enamel making, brick and ceramic manufacturing, glues and adhesives production, fluoridation of drinking water, waste from sewage sludge, and the production of uranium trifluoride (UF_3) and uranium hexafluoride (UF_6) for the nuclear industry (Environment Canada, 2001). Most of these new sources of fluorine to the atmosphere and hydrosphere are the result of processing Earth materials that had previously been largely biologically unavailable as little as 60 years ago.

Taken together with the advent of fluorinated agrichemicals and phosphate fertilizers introduced to the food chain via intensive agricultural practices (Hudlicky and Pavlath, 1995), the development and marketing of an FDA-approved fluoridated toothpaste by Proctor and Gamble Company, and the application of deep well drilling technology to groundwater resources (Bailey, 2006, personal communication) that also coincided with the post-war era, it is perhaps not too much of an exaggeration to say that consumer choices (i.e., what you eat, where you live, where you get your drinking water) now play a bigger role in determining overall fluorine exposures than Nature. And whether water in particular is considered to be "high" or "low" in fluoride is relative only to established benchmarks that seem to vary considerably depending on its intended use but not its eventual fate.

In broad terms, it can be said that groundwater supplies in arid climates in North America are more fluoride rich than those in temperate climates; that aquifers influenced by certain igneous and metamorphic earth materials are generally more fluoride-enriched than aquifers pumping from sedimentary rock (although sedimentary aquifers are more widespread); that deep-source bedrock water wells produce more fluoriferous water as compared to shallow overburden wells; and that bedrock aquifers that are highly fractured due to industrial blasting, hydraulic fracturing, meteorite impacts, seismicity, and/or glacial isostasy are higher in fluoride than undisturbed formations (Boyle, 1976).

Skeletal Fluorosis: The Danger of Drilling Deeper

In the 1970s, when the shallow dug wells of a small town in Canada's Gaspé Peninsula were no longer able to meet their needs, the residents of Maria, Québec, did what most rural residents would do –they drilled deeper. This has become standard practice in most parts of Canada, where 33% of the population currently rely on groundwater resources, especially with mounting concerns over the vulnerability of shallow wells to dropping water table levels associated with climate change and susceptibility to anthropogenic surface contaminants like road salt run-off, landfill and septic system leachate, fertilizers, pesticides, floodwaters, and manure. What the residents did not anticipate when they drilled through the 10–30 m (30–100 feet) of Quaternary glacial tills, whose mean fluoride concentration was 0.1 mg/l, was that they had been exposing themselves to 100 times more fluoride from "fossil waters" extracted from the highly mineralized and naturally softened Carboniferous sedimentary bedrock aquifer (Fig. 4).

Although it took several years, eventually the dramatically increased incidence of osteoarthritis-like symptoms among Maria residents caught the attention of local public health authorities who, with the help of a geoscientist well versed in fluoride geochemistry, diagnosed *skeletal fluorosis* resulting from the consumption of fluoride-enriched drinking water for as little as 6 years (Boyle and Chagnon, 1995). X-rays of the affected individuals would have been familiar to Dr. Kaj Roholm, who had observed similar effects in the skeletons of Danish cryolite (Na_3AlF_6) workers in Greenland in the 1930s, documenting his findings in the landmark publication, *Fluorine Intoxication: A Clinical-Hygienic Study* in 1937 (Roholm, 1937: source of photos below) (Fig. 5).

Dental fluorosis was not prevalent in either the cryolite workers in Greenland, whose primary route of exposure was via inhaled dust particles, or the mostly adult population of 2,500 in the town of Maria because the critical period of exposure in the biomineralization of enamel occurs before a tooth erupts through the gum-line during early childhood. The human skeleton is continuously being re-modeled through the action of osteoclasts and osteoblasts, replacing itself completely three times over the course of an average lifespan. Therefore, skeletal fluorosis is the most obvious sign of pathology in adults exposed to high levels of fluorine but there is some hope of recovery once fluoride inputs have been significantly reduced, whereas dental fluorosis is irreversible.

Fluorine from any source has biological effects beyond human bones and teeth that are consistent with its unique chemical characteristics. From a geology and health perspective, it is important to realize that

Fig. 4 British postage stamp showing the glaciated terrain of the Gaspé Peninsula and its location on the brackish waters of the St. Lawrence Seaway. The overburden is under the influence of meteoric waters, whereas the presence of sodium increases the solubility of fluoride minerals in the cement of the Carboniferous bedrock sediments

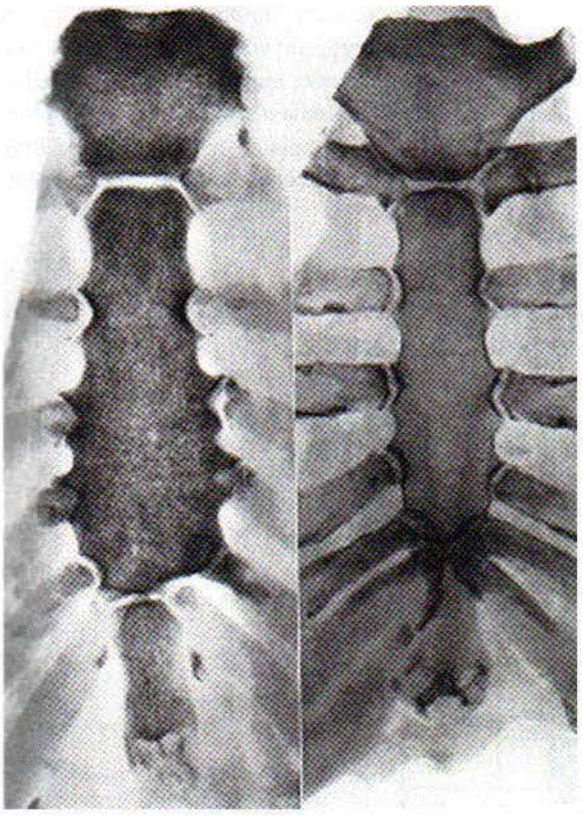

Fig. 5 Chest X-rays of a 51-year-old Danish cryolite worker (*left*) and a 50-year-old non-worker (*right*). The sternum is thickened and misshapen and the articular surfaces of the costal (rib) bones are sclerosed, making inhalation difficult

fluorine's function in nature is to facilitate chemical reactions. It lowers the energy required to both bring certain elements together and break molecules apart – its behavior remains the same across the lithosphere, atmosphere, biosphere, and hydrosphere. This raises questions regarding the extent of the effects of anthropogenic fluorine exposures in the human system as well as the ecosystem, as municipal and industrial wastewaters are discharged into surface water bodies at levels that are greater than 10 times what sensitive aquatic species can tolerate (Environment Canada, 2001).

The combination of natural and man-made fluorine compounds in the upper atmosphere is resulting in "greenhouse powerhouse" gases like trifluoromethyl sulfur pentafluoride (SF_5CF_3) (Sturges et al., 2000) and fluoride-facilitated mineralization in the pineal gland early in life is thought to be contributing to the premature sexual maturation (Luke, 1997) with all of its associated "social system" implications related to early parenting. Infancy appears to be a critical time with regard to fluorine exposures and the development of symptoms of systemic fluorosis in adulthood, an aspect that was not captured in the early water fluoridation studies that lasted only 10 years (Bast et al., 1950).

One of fluorine's often over-looked effects in the hydrosphere is that it makes lead-, copper-, and cadmium-containing compounds in plumbing pipes and fixtures and cookware more soluble in water, particularly at the higher temperatures that might be experienced from the water heater to the tap or while cooking with copper pots (Boyle, 1976). Geochemistry tells us that the corrosivity of a low pH solution (i.e., surface water) is further enhanced when Na^+ and Cl^- ions are also present (Barnes, 1979), as is the case when certain disinfecting agents like sodium hypochlorite or chlorine bleach (NaClO) and chloramine (NH_2Cl) are added to naturally or artificially softened water. Many naturally low-fluoride North American municipal water supplies are now artificially fluoridated to levels of between 0.6 and 1.2 mg/l using fluoride salts (NaF, villiaumite also known as sodium fluoride) or, more commonly, with fluorine-rich by-products of phosphate fertilizer processing like hydrofluosilicic acid (H_2SiF_6) that also contain other elemental constituents like lead, arsenic, and natural radionuclides because phosphate mineral deposits are never 100% pure (Wedepohl, 1978).

Systemic Fluorosis: The Catalyst of the Universe

Lead is among the handful of elements that are known to have adverse neurological effects to which unborn and young children are the most vulnerable due to their low body weight and susceptible stage of brain development (Gavaghan, 2002). Aside from updating old infrastructure, recommending to homeowners that lead plumbing be replaced, and incorporating the use of lead-free materials into the building code, managers of municipal water supplies can also control corrosion in the system by using some additives that adjust pH and alkalinity and others that are meant to inhibit leaching through the formation of an inorganic film on the inside of the pipes. The effectiveness of this last measure will depend heavily on the purity of the corrosion inhibitors (typically orthophosphate, polyphosphate and sodium silicate), as phosphate rock

contains between 10,400 and 42,000 mg/kg of fluorine (Boyle, 1976) and some sodium silicate minerals contain up to 5% fluorine by weight (Wedepohl, 1978), possibly doing more harm than good in the cases where artificial fluoridation is the cause of the corrosion (Fig. 6).

High lead exposures in childhood can have significant long-term neurological effects that can range from extremely subtle to gross impacts on motor function. Some research data indicate that high early childhood exposures are associated with significant long-term effects including lower intellectual performance

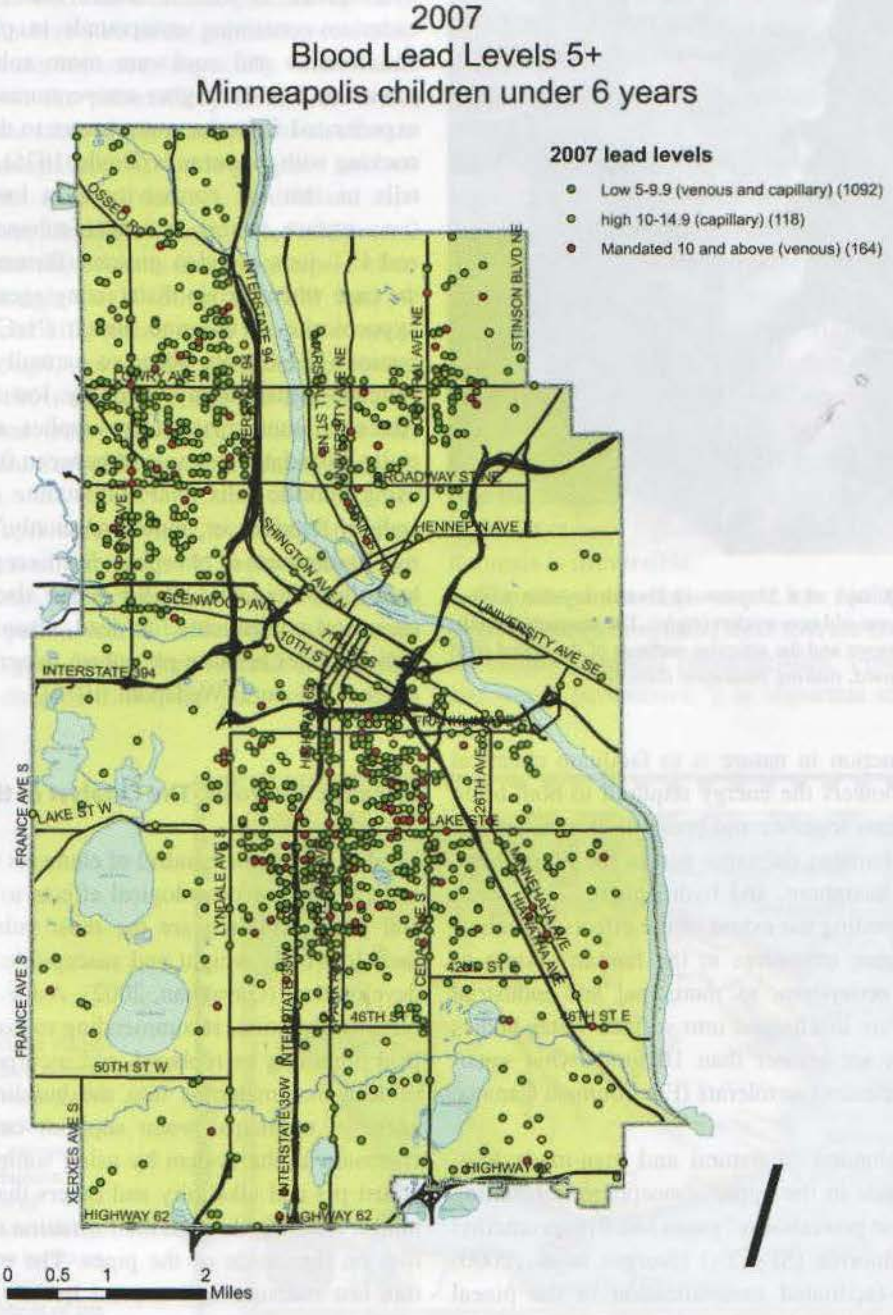

Fig. 6 Blood levels in children in Minneapolis collected by the Public Health Unit

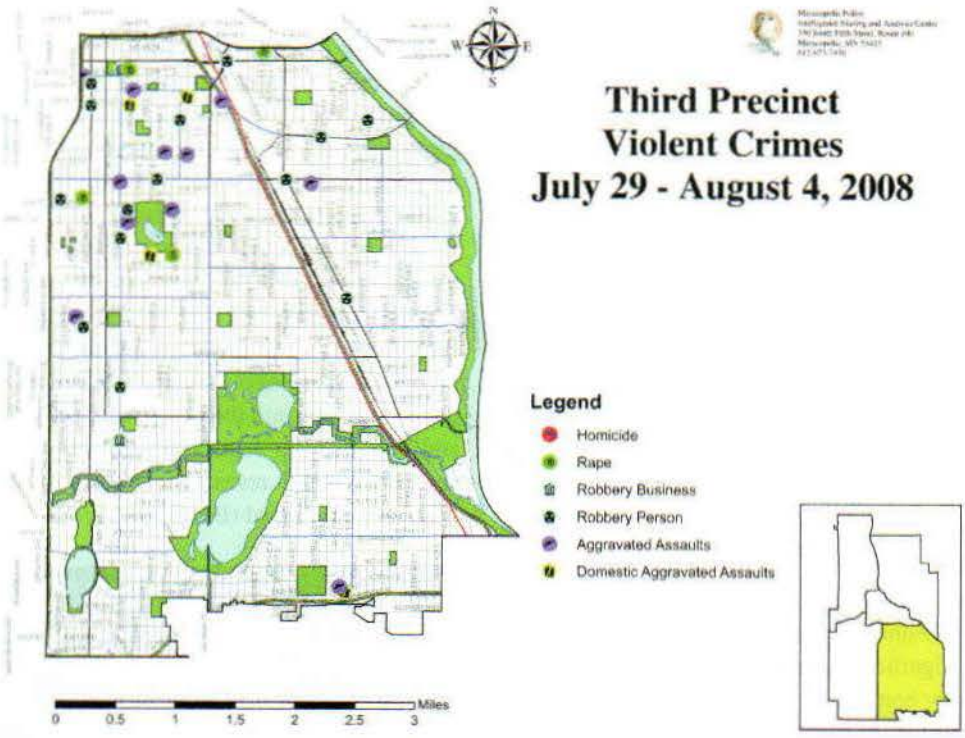

Fig. 7 Violent crime incidence for the week of July 29 – August 4, 2008 in the Third Precinct of Minneapolis, a US city that artificially fluoridates its drinking water. Adding fluorosilicates to weakly-mineralized and low-pH surface water from lakes and rivers increases community lead exposure, particularly in older and economically-depressed neighborhoods where lead plumbing has not been updated. Fluoride in water also increases the leaching of copper, cadmium and zinc from infrastructure, contributing to metal toxicity in consumers

and higher rates of delinquency. Large and long-established communities like Minneapolis, Minnesota (incorporated in 1867), are particularly at risk because of the metals in the pipes of the old infrastructure that is common to the more densely populated and poorer parts of town where nutritional status is also low. Residences closest to the treatment and distribution centers might also be receiving higher doses of chlorine and fluorine (up to 1.2 mg/l) added to Mississippi River water as compared to those at "the end of the line." Though there are more questions than answers at this point, aided by GIS technology, a multidisciplinary team of researchers is currently investigating different aspects of the relationship between fluoride-enhanced lead exposures via drinking water and violent crime rates in major US cities (Fig. 7).

Prior to the Industrial Revolution, overly fluorine-rich "provinces" were generally restricted to specific natural environments like coastal, volcanic, and arid areas, or to places with deposits of soluble fluoride minerals like fluorite (CaF_2), villiaumite (NaF), and cryolite (Na_3AlF_6) and/or rifted, faulted, and fractured terrain (Edmunds and Smedley, 2005). Given its chemical properties, it becomes clear that sufficient fluorine exposure to meet the biological requirements of a particular organism is easily obtained from a variety of sources –even outside of these "fluoriferous" natural environments –without any effort, and so attention needs to be focused on avoiding toxicity.

Fluoride's geochemical associations with some "bad company" in the public health world, together with the enhanced solubility of certain metals found in plumbing and fixtures in the presence of fluoridated water (particularly with a low pH and low calcium–magnesium content as is common to surface water sources), make it a potentially useful tool for identifying communities in environments that are naturally prone to arsenicosis, heavy metal toxicity, and radon gas exposure from the radioactive decay of uranium in earth materials.

HEATHER GINGERICH (Baptie, MSc '06) is the director of the Canadian chapter of the International Medical Geology Association, sits on the board of directors for the Ontario branch of the Canadian Water Resources Association, and is a PhD candidate at the University of Queensland's School of Population Health in Australia. Contact her at medical.geologist@gmail.com.

PHOTO: TRISH ROBERTS, CUSTOM CONCEPT PHOTOGRAPHY

» THE LAST WORD

Look beyond bacteria when assessing water quality

Like many mothers, I often struggle with the sensation of being invisible. And while my eight-year-old "Hobbit-hooked" son believes this to be a tremendous advantage (particularly when trying to evade goblins), when you have a child with a complex health issue and it's the provincial government that can't see you, you've got trouble.

My graduate research at Waterloo showed that water chemistry varies considerably from source to source, but that health standards only exist for a handful of natural contaminants – a small fraction of hydrocarbons and only 29 of the 92 naturally occurring elements of the periodic table.

While a few studies consider adult health outcomes relative to water chemistry, they are mostly as old as I am, and the health effects on children and formula-fed infants are hardly studied at all. Both as a parent and as a member of a community where bacteria-free but highly mineralized "bullet water" shoots out of the taps, I am justifiably vexed that millions of Ontario residents with water-related health problems have been made effectively invisible by the Clean Water Act.

More harm than good is done by defining "water quality" exclusively in terms of the presence or absence of a select few microbes. And by erecting a knee-jerk legislative framework that only recognizes a very narrow suite of surface contaminants related to certain human activities, they entirely missed the crucial element of the water-environment-health connection.

As a result of this bias of attention toward bacteria, healthcare workers are made blind to the fact that consuming chemical cocktails of naturally occurring substances, water treatment additives, and/or unlisted organic compounds can be harmful – especially for little people in sensitive stages of development. And, unlike E. coli contamination, which does its explosive damage in a few days, the quiet fuse for many of these environmental exposures is often hidden in the kidneys, and it can run for decades before igniting a health crisis.

Hippocrates, founder of modern medicine, agrees. "[Excessive minerals in water] are harsh, cause difficulty in urination, and prevent excretion," he said, nearly 2,500 years ago.

Translation: Consuming highly mineralized groundwater has its hazards. Natural waters contain varying amounts of all the elements found in the Earth's surface materials, and some – particularly the iron, sulphides, calcium, fluoride, and carbon-containing compounds that are common to southern Ontario – can undermine good health.

Dissolved minerals and hydrocarbons that you can see, taste, smell, and feel (particularly in the kidneys) impact the health of future generations in a variety of ways that are difficult to perceive if all you're looking for is E. coli.

HEATHER GINGERICH

From: Susan Schweitzer [mailto:schweitzer@youmano.com]
Sent: Friday, March 30, 2012 4:12 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Michael Fogarty; Paul Spears; Pete Bowen; Tony Madden
Cc: JASON COVEY
Subject: Susan Schweitzer Re: Process On Water Fluoridation

Dear Mayor Orsi and City Councillors,
Please, accept the attached letter from Council Of Canadians, which is addressed to you, and please, accept this CofC Resolution as information to consider in your deliberations on water fluoridation. Thank you. Sincerely, Susan Schweitzer
Jason, please, add this to the process. Thank you. Susan

THE COUNCIL OF CANADIANS LE CONSEIL DES CANADIENS

March 20, 2012

Dear Mayor Orsi and City of Orillia Councillors:

The Council of Canadians is Canada's largest member-based advocacy organization with tens of thousands of members and over 70 community-based chapters across the country. We are a social justice organization and address environmental issues through an environmental justice perspective.

Maude Barlow, the National Chairperson of the Council of Canadians, also served as Senior Advisor on Water to the 63rd President of the United Nations General Assembly (2008-2009).

The Council of Canadians is opposed to the fluoridation of drinking water. We are concerned by the health and environmental impacts associated with it.

Drinking water is fluoridated in Canada, the United States and Australia, but almost nowhere else in the world. Western Europe and Japan have almost no fluoridated water supplies.

We are working with the Quebec-based group Eau Secours which is opposing the Charest government's plans to increase the fluoridation of water there from about 3 per cent to 50 per cent. We encourage our chapters across the country to promote local debate and move municipal resolutions in their community on this issue.

Water is a commons – a shared entity – and open dialogue and encouraging public participation in issues affecting water quality are critical to ensuring clean, safe drinking water for current and future generations. We applaud Susan Schweitzer from the Orillia Citizens Against Fluoride (OCAF) and others' initiatives to bring this important matter before Orillia City Council. We also applaud your openness to hear concerns from the residents of Orillia.

We understand that input to the process of the City of Orillia water fluoridation must be submitted by March 30th, 2012. We appreciate your consideration in this issue and the protection of safe drinking water and human health in the City of Orillia.

Thank you for your attention into this matter.

Sincerely,

Maude Barlow
National Chairperson
Council of Canadians

Emma Lui
Water Campaigner
Council of Canadians

700-170 Av. Laurier Ave West/Ouest, Ottawa, Ontario K1P 5V5
Tel: (613) 233-2773, Fax/Téléc: (613) 233-6776
www.canadians.org inquiries@canadians.org

Council of Canadians Resolution on Water Fluoridation
Passed Oct 23, 2011 at AGM in Montreal

Whereas municipal drinking water borrowed from and returned to the environmental water commons should meet a continuum of quality, ethical purpose and sustainability both coming and going;

Whereas artificial water fluoridation is a practice whereby municipalities can add fluoride to their own drinking water but have no corresponding accountability for putting that fluoride into the downstream water commons via treated waste water;

Whereas there are two guidelines for fluoride: Health Canada's narrow-focused one of 0.7 mg/L for *increased* fluoride in municipal water, infringing on the sustainability of the water commons with a Canadian Water Quality guideline *limit* of 0.12 mg/L;

Whereas neither fluoride guideline is regulatory, but the Canadian Water Quality Guideline of 0.12 mg/L protects both human health and aquatic species and therefore should be observed; but the Health Canada guideline does not protect the health of several vulnerable groups including babies, and harms aquatic species;

Whereas the chemicals used to *increase* fluoride in municipal water to reach the Health Canada guideline, hydrofluorosilicic acid or sodium silicofluoride are *not* regulated by Health Canada at all, but *are* regulated by Canadian Environmental Protection Agency as Class 1 cumulative, persistent, hazardous toxins that *must not be emitted* to the environmental commons of soil, air or surface water at all;

Whereas anyone is free to decide to take fluoride drugs that Health Canada has approved and regulated, or food and drink with naturally occurring fluoride, without adding restricted fluoride pollutants to drinking water and the downstream water commons;

"Therefore, be it resolved that the Council of Canadians provide national leadership towards a policy of drinking water quality regulation that disallows water fluoridation, based on Canadian Water Quality Guideline for fluoride in the environmental commons."

Moved by: Anne Levesque Seconded by: Pina Belperio Carried

-----Original Message-----
From: lisa ingram [mailto:persephone@inbox.com]
Sent: Thursday, March 29, 2012 1:48 AM
To: Tony Madden
Subject: No to Fluoride

Greetings, Councillors.

My stance is a simple one: No.

We have tons of chemicals poured into our foods, as well as our water in the name of 'progress'. $25,000 is a hefty sum to pour more in. Fluoride is toxic to bodily cells. Have you ever read a warning on toothpaste? It says 'DO NOT EAT'. However, we'd be doing exactly that- Consuming fluoride.

Even worse, it will end up in our crops in high concentrations. A number of Cities have removed Fluoridation including Alberta.

My third point:

I do not use fluoride and I rarely if ever get cavities. I had not been in to see a dentist in ten years. They were astounded that my teeth were still in good condition! I did not even use fluoridated toothpaste (I only buy fluoride free).

I have a lot of health issues and have found going to preservative free breads (Orillia bakery), cutting out processed food and drinks (Cola, Pre-packaged foods) has improved my health immensely. Orillia has a tight budget. We cannot afford to add Fluoride to it- for our health or our taxes.

Lisa Ingram, Red Cross worker

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of pvancaulart@cogeco.ca
Sent: Friday, March 30, 2012 8:45 AM
To: JASON COVEY
Subject: Fluoridation

Orillia:
Know that no community in Canada has started up a fluoridation scheme since 1995 when warnings about the harms of silicofluoride use began coming to light. In those 18 years there has been a massive focus on drinking water quality and integrity precipitated by events in Walkerton. Since 2007 more than 2,000,000 Canadians have ceased water fluoridation in their respective cities. Canada's population is 66% fluoridation free.

In 2013, the mechanisms for a standard of care will come into force in the safe drinking water act. After that time any person in authority of a drinking water system will be personally liable for harms done or for things not done with respect to drinking water quality and safety.

Unless you have satisfied yourselves fully that their is no harm done by silicofluoride ingestion to any in the population or that drinking water quality is the highest it can be will the technology used to treat it and protect the source waters from increased silicofluoride contamination, the you must seriously reject the idea that fluoridation is the panacea you seek as urged by the MOH.

For your consideration I attach the finding of Fairbanks Alaska, a municipality that did their own due diligence with respect to fluoridation last year.
Sincerely,

Peter L.D. Van Caulart, Dip.A.Ed.,CES,CEI Director, Environmental Training Institute Vice President, Canadians Opposed to Fluoridation

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From: dianne orton <diniii@distributel.net>
Sent: Friday, March 30, 2012 9:28 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: Jason Covey
Subject: Battle over fluoride warning intensifies in New Hampshire

Please enter this information for consideration in your report to Council on the fluoridation issue.
Battle over fluoride warning intensifies in New Hampshire Thursday, March 29, 2012 by: Doug Cragoe
I've applied to google for an adsense account but they have not written back to me with anything yet.

(NaturalNews) In 2006 the Centers for Disease Control (CDC) and the American Dental Association (ADA) finally admitted what dental researchers had been saying for many
years. If powdered infant formula is prepared with fluoridated water infants are put at increased risk of a developmental disturbance called fluorosis. This causes disfigured teeth
with white spots, streaks, and occasionally brown stains that can affect a child's appearance and self esteem. Fluorosis can be expensive to fix, and no government program or dental
insurance will pay for it. Fluorosis has been increasing in the U.S. to the point where half of American teenagers are affected to some degree. So to reduce this risk the CDC and
ADA both recommended that parents consider the use of non-fluoridated water for infant formula preparation. Now legislators in New Hampshire are trying to inform parents about
this risk, but are running into opposition from ADA-connected dentists.

Keeping quiet about the risk to infants
After the CDC and ADA published their web pages about the risk they made no further effort to inform parents or pediatricians. They feared too much publicity about this might
bring negative attention to fluoridation. They were right. Opponents of fluoridation spread the word about infants at risk and it became one of the key reasons many cities stopped
fluoridation after 2006.

Despite efforts to downplay the risk, legislators in New Hampshire thought parents should be informed. A bill to require printed warnings on water bills was introduced. In
committee hearings dentists said things like this would "scare people" and "make them think fluoride is dangerous." Despite such statements, on March 15 the bill passed the
assembly by a vote of 253 to 23. Now the bill moves on to the state senate.

Big doses of fluoride now claimed to be good for infants
In 2011 a group of ADA scientists who are fluoridation advocates released new scientific recommendations that apparently were meant to counter efforts to inform parents about this
risk to infants. They reversed their earlier advice and said fluoridated water could actually be recommended to prepare infant formula. The reasoning behind this new advice was
never explained. The fluorosis risk of disfigured teeth was unchanged and, just as in 2006, there was no good evidence that giving large doses of fluoride to infants provided any
benefit. Many of these infants are dosed above the tolerable upper intake level. These large doses of fluoride could be having other negative affects on infants.

Along with the 2011 recommendations the ADA has a new policy that calls for a "shared" decision between parents and dentists about the type of water to use for infant formula.
One problem is that infants are born without any erupted teeth, and parents are unlikely to take a toothless baby to see a dentist. Even after their teeth erupt they might not see a
dentist until long after they stop drinking infant formula.

New policies to inform parents
WIC programs hand out free powdered infant formula to low-income parents. In 2006 most of these programs refused to inform parents about the risk. But in 2009 the Texas WIC

program began to inform parents about the fluorosis risk. The Austin Texas city council, after prodding by fluoridation opponents, had warnings about infant formula posted in local
WIC offices.

Infant formula risk is typical of the fluoridation issue. The more people know about fluoridation, the less likely they are to support it. Debates are discouraged by promoters.
Campaigns to start fluoridation often use speed and stealthy tactics to get it passed before the public realizes what's happening.

Sources for this article include:

Earlier Natural News report on the New Hampshire bill:
http://www.naturalnews.com/031188_fluoride_infants.html

Fluoride Action Network on fluoride warnings for infants:
http://www.fluoridealert.org/health/infant/

ADA study recommending fluoridated water for infant formula:
http://jada.ada.org/content/142/1/79.full

CDC webpage on infant formula and fluorosis:
http://www.cdc.gov/FLUORIDATION/safety/infant_formula.htm

About the author:
Doug Cragoe is an activist concerned with the increasing level of fluoride exposure in the United States.

Learn more: http://www.naturalnews.com/035388_fluoride_New_Hampshire_water.html#ixzz1qbdUd2Ps

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From: dianne orton [mailto:diniii@distributel.net]
Sent: Friday, March 30, 2012 10:10 AM
To: Tony Madden; Andrew Hill; Paul Spears; Michael Fogarty; Linda Murray; Pete Bowen; Patrick Kehoe; MAYOR EMAIL
Cc: Jason Covey
Subject: The Fluoride Deception exposes the truth about water fluoridation and the phosphate mining industry

Please enter this information for consideration in your report to Council on the fluoridation issue.

Vote No To Fluoridation Of Our Water!

http://tv.naturalnews.com/v.asp?v=42652E035A1B1BAAAE1F340B54694975 An excellent video 12:58 min

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From: Valerie Harmsworth [mailto:valharms@rogers.com]
Sent: Friday, March 30, 2012 11:10 AM
To: JASON COVEY
Cc: MAYOR EMAIL; Patrick Kehoe; petebowen12@mail.com; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Water fluoridation, PLEASE vote NO!

J. Covey, please submit this letter to council

I, Valerie Harmsworth, ask the Mayor and Counsellors of the City of Orillia, to vote NO on my behalf on the issue of fluoridating Orillia's drinking water. I do not want the toxic waste known as hydrofluorosilicic acid added to my drinking water.

Initially, I could not believe Orillia Council was actually contemplating this dangerous and potentially illegal action... again. Cities and towns all over Canada and the U.S. are removing or trying to remove this poison from their municipal water supply. Orillia citizens have already fought this battle successfully (twice!) Please don't be the council that has us take a giant step backward.

There are better, more effective (topically applied), sources of fluoride for those who (arguably) need it. Money would be far better spent on dental and dietary education, as well as increased programmes and dental access.

How does your body process all that ingested fluoride? How does the ecosystem process all those barrels of industrial waste that will end up in Lakes Couchiching and Simcoe?

Proponents of fluoridated water would have you believe that 'fluoride' continues to harden the teeth, and yet has no effect on the rest of the body, passing through harmlessly. Does this make any sense?

Proponents of fluoridated water call it 'junk science' when 'fluoride' is implicated (at the very least) in causing myriad health issues. What if they're wrong? ..and what if all that 'junk science' is even partially right? ..as I believe much of it is. This is far too important to take the risk.

I believe the Mayor and Councillors have been unfairly placed in the position of making this decision. They are being asked to implement someone else's agenda.

I DO NOT WANT fluoride added to my water without my consent and against my better judgement.

Valerie Harmsworth
10 Wyandotte St.
Orillia, ON
L3V5M6
705-325-5852

clean water is fluoride free

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Friday, March 30, 2012 11:46 AM
To: JASON COVEY
Subject: Policy on Fluoride - Canadian Dental Association

Hello Jason,

Please include the following in the Public Record on Fluoridation. Thank you.

Colleen O'Neill

For the Public Record

My questions to Dr. Charles Gardner, MOH, regarding the Canadian Dental Association's Policy on Fluoride, have remained unanswered. The letter was sent March 5, 2012. I resent the letter March 18, 2012.
Colleen O'Neill

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Friday, March 30, 2012 12:12 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; Charles Gardner; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Subject: Water Fluoridation pollutes our Lakes!

I am a retired Engineer living near Orillia. I have been a life long Environmentalist. We support Council of Canadians, Greenpeace and other groups.

The subject of water fluoridation is the **first** that I have EVER tackled as an activist because it is so WRONG! It is an issue that is:

1. Unethical. It treats Humans, not the water!
2. A Human Rights issue - it is mass medication without our permission! The town council can do what no doctor can do!
3. Degrading to everyone's health. There are many studies that show increases in most diseases - cancer up 30% in only 2 years after introduction and a DOUBLING of hip fractures, just to name a few.
4. Ineffective - it does not work! Why go to all this trouble for very little (potential) gain? At best, fluoridation may prevent one cavity in a child's life!
5. An environmental disaster! - see below for more details.
6. Yet another failing of our Health Care System. All the way from Health Canada to local dentists/doctors, they support this UNREASONABLE practice. Anyone who speaks out against fluoridation WILL LOSE THEIR LIC. TO PRACTICE! (and a few have).

There is a group of people in Orillia that are looking deeply into this subject because the Council will be voting on it in June of this year. Fluoridation is being proposed by all levels of Gov't to help reduce tooth decay in children! The efficacy of this is questionable at best and TOTALLY ineffective according to many scientific reports. The driving force behind this is simply "TOXIC WASTE DISPOSAL", plain and simple. Hard to believe, I know!

The so called fluoride that cities purchase for water fluoridation is a level 4 toxic waste byproduct of the fertilizer industry - called Hexafluorosilicic Acid. It contains 24% fluoride, arsenic, lead, mercury and a whole host of other undisclosed toxins (up to 300!). It is NOT elemental Fluoride, it is NOT the same as used in toothpaste, it is NOT food or pharmaceutical grade, it IS "Commercial" grade. It has a ph of 1.2 - like battery acid. For the city of Orillia, with 30,000 people, they will "dispose" 88 forty-five gallon drums of this waste product that CANNOT be disposed of in any other manner. Once purchased, this toxic substance that cannot be dumped in the worlds oceans by International agreement, becomes a product and therefore gets around environmental/disposal laws.

Based on one lab analysis of a shipment of Hexafluorosilicic Acid that was shipped from Florida to the city of Toronto, the arsenic level was such that 3.5 to 56 US gallons of pure arsenic would be dumped into the water each year in Orillia, pass thru the water treatment plant completely unaltered and flow into Lake Couchiching go down stream into Georgian Bay and eventually to the ocean. The board that governs the "quality" of Hexafluorosilicic Acid for use in water fluoridation states that, in order to be "acceptable", it must contain less than 200 mg/litre of lead - implying that it could have this much lead in it. Generally, it does NOT contain this much, but the next batch shipped could!

The city of Toronto dumps approximately 533 TONS of this toxic waste into Lake Ontario each year. In Canada, approximately 7000 TONS (50% of the population is on fluoridation) is dumped (233 fully loaded semi-trucks).

Is it any wonder that our Eco-Systems are taxed to the limit!

The old saying that "the solution to pollution is dilution" is fine up to a point - but when we add up all the toxins being "diluted", the net result is JUST NOT SUSTAINABLE and has long ago passed the point of no-return.

Please, could you ensure that your position on fluoridation will not cause pollution in our precious water.

Please vote "NO" to water fluoridation!

Thank you,
Steve Goulter
705 484 0509

From: Colleen O'Neill
Sent: Sunday, March 18, 2012 1:09 PM
To: Colleen O'Neill
Subject: Fw: Policy on Fluoride - Canadian Dental Association

Re-submitted on line SCMDHU March 18, 2012

----- Original Message -----

March 5, 2012

Dr. Charles Gardner
Medical Officer of Health
Simcoe County District Health Unit

Dr. Gardner:

RE: Community Water Fluoridation for Orillia
CDA Policy Statement on Fluoride

The Canadian Dental Association Policy Statement on Fluoride, http://www.cda-adc.ca/_files/position_statements/Fluorides-English-2010-06-08.pdf
raises concerns and questions.

"The availability of fluorides from a variety of sources must be taken into account before embarking on a specific course of fluoride delivery to either populations or individual patients. This is particularly important for children under the age of six, where exposure to more fluoride than is required to simply prevent dental caries can cause dental fluorosis. Provided that the total daily intake of fluoride is carefully monitored, fluoride is considered to be a most important health measure in maintaining oral health for all Canadians.
CDA recognizes the need to monitor the scientific literature with respect to levels of exposure to fluoride and general health to ensure the continued safe and effective use of fluorides in dentistry." Revised April 2010

Dr. Gardner, my questions:
1. How does anyone know what amount of fluoride each individual in Orillia is presently receiving in order to take it "into account "?

"The availability of fluorides from a variety of sources must be taken into account before embarking on a specific course of fluoride delivery to either populations or individual patients."
We know that all of us are exposed to fluoride through the food we eat, beverages we buy which may be made with fluoridated water, (pop, juice), dental products, tea, pesticide residues on food etc. The amount of fluoride in each item is not identified on labels, beverages, food etc.

2. Personally, I have no idea of the amount of fluoride I am ingesting. Since CWF would increase the amount of fluoride each individual ingests and absorbs, how could anyone ensure that any additional amount is safe?

3. Since the amount of fluoride ingestion is currently unknown for each individual, how can "the total daily intake of fluoride be carefully monitored" as outlined in the CDA Policy Statement? Provided that the total daily intake of fluoride is carefully monitored, fluoride is considered to be a most important health measure in maintaining oral health for all Canadians."

I await your reply.

C.M. O'Neill

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Friday, March 30, 2012 11:50 AM
To: JASON COVEY
Subject: For Public Record on Fluoridation

Hello Jason,

Please include the following in the Public Record on Fluoridation. Thank you.

Colleen O'Neill

The following letter was sent to the Honourable Leona Aglukkaq, MP, Minister of Health on March 6, 2012. To date, it has not been answered.

Colleen O'Neill
1102 Kitchen SR
RR1 Coldwater ON L0K 1E0

March 6, 2012

The Honourable Leona Aglukkaq, PC MP
Minister of Health

Dear Minister Aglukkaq:

RE: Community Fluoridated Water

I am deeply concerned, especially for babies and young children, about the many detrimental health issues associated with Community Fluoridated Water.

Health Canada does not regulate as drugs, the fluorosilicates, hexafluorosilicic acid (H2SiF6) and sodium silicofluoride (Ns2SiF6), used as a treatment for dental cavities. These chemicals are hazardous waste products , mainly from the fertilizer industry. Great Lakes United reports that "the Basel Convention, Environment Canada and United States Environmental Protection Agency (US EPA) all state that the chemicals used in artificial water fluoridation are hazardous waste which may not be put directly into lakes, rivers and oceans" (Great Lakes United Resolution regarding artificial water fluoridation).

Why have these hazardous chemicals not undergone new drug applications and assigned numbers by Health Canada?

Children exposed to these hazardous chemicals are being put at risk of developing fluorosis of the teeth, a manifestation of systemic fluoride poisoning. Other diseases linked to exposure to these chemicals include brain damage, lowering of IQ, cancer, brittle bones.

The Canadian Dental Association Policy Statement outlines measures which must be taken regarding exposure to these chemicals. "The availability of fluorides from a variety of sources must be taken into account before embarking on a specific course of fluoride delivery to either populations or individual patients.... Provided that the total daily intake of fluoride is carefully monitored, fluoride is considered to be a most important health measure in maintaining oral health for all Canadians."

As you know, Minister Aglukkaq, it is impossible to monitor individual exposure to the fluoride as it is found in many unlabelled foods and beverages. Fluoride accumulates in our bones, teeth and brains.

I request that Health Canada prevent the use of these untested drugs in Community Fluoridated Water.

Thank you for your attention to this very important health issue.

C. M. O'Neill

From: marilyn goulter [mailto:goulter255@hotmail.com]
Sent: Friday, March 30, 2012 12:39 PM
To: JASON COVEY
Subject: Water fluoridation - data for the public record

Jason;
Would you please ensure that any and all data, correspondence, e-mails, etc sent to you by myself on the subject of WATER FLUORIDATION is entered into the PUBLIC RECORD for this topic, even if it did not specifically request it at the time.
Thanks
Steve Goulter

From: Linda [mailto:lupper2@rogers.com]
Sent: Friday, March 30, 2012 1:53 PM
To: Patrick Kehoe; Pete Bowen; lindamurray170@gmail.com; Andrew Hill; Tony Madden
Subject: Water Fluoridation

To Counsellor Kehoe, Counsellor Bowen, Counsellor Murray, Counsellor Hill and Counsellor Madden,

I, Linda Upper, ask you as the Mayor and Counsellors of the City of Orillia, to vote NO on my behalf on the issue of fluoridating Orillia's drinking water. I do not want the toxic waste known as hydrofluorosilicic acid added to my drinking water. I feel this would be an invasion on my right to clean drinking water. My husband and I moved to Orillia from

Niagara Falls two years ago to be able to enjoy clean, fresh air and clean, fresh water. If hydrofluorosilicic acid is voted in and added to the drinking water, my husband and I will move out of Orillia to another place that is fluoride-free. Please, vote NO to adding fluoride to our water.

Sincerely,
Mrs. Linda Upper.
46-337 West St. N,
Orillia, ON
705-259-1096

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of leekelly@rogers.com
Sent: Friday, March 30, 2012 2:00 PM
To: JASON COVEY
Subject: opposition to fluoridation

I disagree that adding fluoride to Orillia water is an effective way to reduce cavities.Topical application of fluoride may be helpful for those who do no observe proper oral hygiene - but to require all citizens to ingest fluoride is not the answer.

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of leekelly@rogers.com
Sent: Friday, March 30, 2012 2:02 PM
To: MAYOR EMAIL
Subject: opposition to fluoridation

I disagree that adding fluoride to Orillia water is an effective way to reduce cavities.Topical application of fluoride may be helpful for those who do not observe proper oral hygiene - but to require all citizens to ingest fluoride is not the answer. Please vote NO to fluoridation.

From: Kallie Miller [mailto:4optimallife@rogers.com]
Sent: Friday, March 30, 2012 2:24 PM
To: MAYOR EMAIL
Cc: Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Tony Madden
Subject: fluoridation

Dear Mayor
My name is Kallie Miller. I am a retired registered nurse from London, Ontario. I belong to a group Safe Water London. We have been working to end fluoridation in London for ten years. We expect that will come to fruition in the next couple of months.

Are you aware of the recent events in Windsor? The Windsor Utilities Commission has recommended to the Windsor council that they stop fluoridating the water. Amherstburg, Tecumseh, Lakeshore have recently ended fluoridation and now Windsor Utilities Commission is recommending Windsor turn off the tap. We imagine LaSalle will be following suit shortly.

Here is a 7 or so minute you tube video with the commentary below the url
http://www.youtube.com/watch?v=HiCcOL3f1Mo

Uploaded by FluorideFreeWindsor on Mar 16, 2012

In this video we see Windsor/Essex Medical Officer of Health, Dr. Heimann, admit ""It is my responsibility to provide the information specifically to the questions and the issues with regards to safety and CERTAINLY, if that is not able to be done, then it is ABSOLUTELY appropriate with regards to the PRECAUTIONARY PRINCIPLE."
Councillors asked for the toxicology safety studies on hydrofluorosilicic acid, but these do not exist, as confirmed by Windsor Utilities Commission (WUC) administration. And so councillors of Tecumseh were right in voting to cease fluoridation and exercise precaution. This recommendation will now go to City of Windsor where councillors there will have the final say.

Precautionary Principle Links:
Thyroid Science: http://www.slweb.org/bibliography.html#thyroid
Dental Fluorosis Science: http://www.slweb.org/bibliography.html#fluorosis
Alternatives to Fluoride: http://www.slweb.org/bibliography.html#alternatives

WUC video on the lack of safety studies and compliance with Standard NSF60:
http://www.youtube.com/watch?v=qZ2GKw6zgPw&context=C4f0c087ADvjVQa1PpcFOZ...

WUC video on the source of fluoride, which is the waste product from the phosphate fertilizer industry:
http://www.youtube.com/watch?v=UKFuChX1Yl8&context=C468be8eADvjVQa1PpcFOZ...

For a list of peer-reviewed published studies proving that when fluoridation ends dental caries and dental fluorosis rates decline visit this link and see the end of the article:
http://fluoridefreewindsor.com/2012/01/15/the-test-of-the-morality-for-a-soci...

Fluoride Toxicity information from expert, Heather Gingerich pt1:
http://www.youtube.com/watch?v=v7clyfTMGO0&context=C4214b1eADvjVQa1PpcFOZ...
and pt2: http://www.youtube.com/watch?v=FF9Y0nBBxAs&context=C4a86e14ADvjVQa1PpcFOZ...

Video on the Town of Tecumseh's Safe Water Journey:
http://www.youtube.com/watch?v=cfq8TI-1MJg&context=C4378f53ADvjVQa1PpcFOZ...

More videos of the local campaign for safe water can be found at:
http://www.youtube.com/user/FluorideFreeWindsor?feature=mhee
And more articles can be found:
http://fluoridefreewindsor.com/
More information on the Canadian Safe Water Campaign: http://cof-cof.ca/

Have you done your due diligence? The medical officer of health is not liable, he only recommends fluoridation. It is the mayor and the councillors who will be personally financially and legally liable as of January 2013 under the Safe Drinking Water Act. I have personally done the research to know that there are no toxicology tests.

I can say possibly poisoning because two recent studies show elevated lead levels in children drinking fluoridated water and that is serious. What about the citizens living in old houses where the lead pipes have not been changed? I can supply those study referrals upon request.

Have you noticed that all the "expert" proponents of fluoridation have financial or professional ties to fluoridation while those experts (PhDs, engineers, professors, doctors, M,Scs etc) who want it stopped have no financial or professional ties to having it stopped? In fact, they give their time, energy, expertise and money to a cause which would improve the health of many.

Please do not start poisoning your citizens. I can say that because the dentists and doctors say it is safe and there have been no toxicology studies to say who of us is correct.

Best regards
Kallie Miller, RN

From: ERLE KAHNERT [mailto:erlek4@bell.net]
Sent: Friday, March 30, 2012 3:56 PM
To: Tony Madden; Andrew Hill; Paul Spears; Michael Fogarty; Linda Murray; Pete Bowen; Patrick Kehoe; MAYOR EMAIL
Cc: JASON COVEY
Subject: No To Fluoridating Our Municipal Water Supply

To Mayor Orsi and Ward Councilors of Orillia:

Please do not fluoridate our water supply. It is simply not acceptable at any level to literally poison a population with fluoride. What is needed for people with dental disease is education in dental hygiene and proper dental care with a professional dentist. What is not needed is a chemical that will harm the physical and mental capabilities of all of the population. Vote no to this gross intrusion on the health and well being of everyone.

Thank you,

Erle Kahnert
705 326 6484

From: Lynn Martin [mailto:lynnmartin5@gmail.com]
Sent: Friday, March 30, 2012 4:15 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; Charles Gardner; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Cc: orilliacitizensagainstfluoride@gmail.com
Subject: Fluoride will make me SICK

Dear Mayor and Councillors
I am deeply concerned that you are actually seriously considering pursuing the dangerous and potentially illegal action of adding fluoride to the water supply of the City of Orillia claiming it as a medicine and mass medicating the Orillia population. Please accept this electronic letter as the strongest possible protest from this concerned citizen. **I DO NOT WANT fluoride in my drinking water**. It is against my consent and certainly against my better judgment.

I have an **under active thyroid (hypothyroidism)** and had **Hashimoto's thyroiditis** an autoimmune disease of the thyroid. I worked really hard to reverse my autoimmune disease of the thyroid and control my hypothyroidism and I am now starting to feel better after leaving **Toronto** a fluoridated City.

Fluoride used to be used as a **drug** to treat hyperthyroidism, an overactive thyroid, because it makes the thyroid underactive quite effectively, to slow down the Thyroid function.
This is why I need to be particularly careful in today's over-fluoridated world, where water supplies, plus toothpastes, plus dental rinses, and other treatments all want to put more fluoride into our systems.

Experts recommend I avoid fluoridated water – and try a bottled water that I have verified is fluoride free, and avoid fluoride treatments and fluoridated toothpaste.
The thyroid epidemic could be due largely to the excessive harmful chemicals in our food, air, and water, confusing and stressing our immune systems

Not everyone needs to avoid fluoride like the plague, but thyroid sufferers should.
A statement released January 2, 1997 from the EPA reads: "…indicates a causal link between fluoride/fluoridation and cancer, genetic damage, neurological impairment, and bone pathology"
Original research intended to support the initial addition of fluoride into drinking water was flawed.

Nazi concentration camps used fluoridated water to suppress the will and vigor of inmates
Please I am begging you to say **NO to adding fluoride to our Orillia water system**.

Lynn Martin
401 West St. N. # 208
Orillia, Ontario L3V 7A7
705-325-6158

Jason;
I request that this e-mail be entered into the public record for the fluoridation issue.

Source:

More detailed information about fluoridation and thyroidism can be found in the Thyroid and Fluoride -- A Comprehensive Online Guide http://www.thyroid-info.com/articles/shamesfluoride.htm

For more information, see: Drs. Richard and Karilee Shames' discussion of the issue of fluoride and thyroid disease, as well as other Thyroid/Fluoride Links.

From: Marie Martin [mailto:mariemartinangel@gmail.com]
Sent: Friday, March 30, 2012 4:27 PM
To: MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Peter Dance; Charles Gardner; bill.mindell@smdhu.org; Michael Fogarty; JASON COVEY
Cc: orilliacitizensagainstfluoride@gmail.com
Subject: No Fluoride in My water please

Dear Mayor and Councillor

Please do not add Fluoride to my water. I am a senior and Fluoride makes me sick.

I avoid fluoridated water and have been for some time now. When I go to cites that add fluoride to there water I have to always buy bottled water and I have to shower infrequently because it gets absorbed through my skin and the fluoride vapors in the bathroom really make me feel sick.

Again, please do not add fluoride to my Orillia water.

Marie Martin
3 Julia Crest. Orillia ON L3V 7Y9
705-242-0892

From: Dr. McLean [mailto:drmclean@bdmclean.com]
Sent: Friday, March 30, 2012 5:15 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: JASON COVEY
Subject: A Barrie Dentist Opposed to Fluoridation

Dear Mayor and Council Members:

Several years ago the town of Huntsville here In Ontario was considering discontinuing fluoridation. City Council referred the issue to a sub-committee to flesh out the issue and make a recommendation to the full council. My understanding is that Huntsville commenced fluoridation decades ago largely at the instigation of my colleague and friend, Dr. Rick Riley, now retired. I didn't know Rick at the time, but if I had I would have supported him. That is how we were trained. That is what we believed.

Since that time, Rick changed his mind. Independently of Rick, so did I. A few years ago Rick had the opportunity to try to end the fluoridation he "started." He asked me, with others, to present to the sub-committee. Later, at the public meeting of the council, many issues were discussed and on ALL of them, except the last, any member of the public was invited to comment before a vote was taken. Many did. The last issue was the discontinuation of fluoridation. The fact finding sub-committee made their recommendation to discontinue fluoridation. Then the mayor asked for input from the dental public health officer who had NOT made a presentation to the sub-committee although several pro-fluoridation dentists had done so.

His "words of wisdom" were that the dose makes the difference. He meant that high doses of fluoride are used to kill rats, but that low doses were safe and beneficial. The sub-committee already knew that. They understood that the dental public health officer was referring to the toxicology of ACUTE RATHER THAT CHRONIC poisoning. They also knew that low doses of a fluoride that ACCUMULATE in the body are not safe.

Intriguingly, the mayor did NOT ask for any further input from the public (unlike every other issue on the agenda) but instead immediately called for a vote, and fluoridation was NOT discontinued.

My impression was that the issue had been decided BEFORE the subcommittee had been created and the whole rigmarole was just "democratic window dressing."

If that was not the case then the full council was really impressed by the 15 second presentation of this "expert" and had sweet little respect for the intellect of their colleagues on the sub-committee who had spent many, many hours investigating the issue.

Beware of experts!!

How, then, do you make a rational decision without expert advice?

You don't.

But you need to be able to recognize when a scientific "expert" is talking politics and when she is talking science.

I do NOT mean to imply that the public health experts advocating fluoridation are insincere or the least bit dishonest. They are just passing on what they believe to be the truth. That is the case, for instance, of most dentists. They believe what they were taught in dental school. So did their professors. Do did I.

The issues of fluoridation and other public health matters are supposed to be driven by science. Mostly they are not. They are driven by dogma.

Outrageous?

Science means, by definition, adherence to scientific method. You learned scientific method in grade 5 or so. You wrote about "Purpose, Apparatus, Method, Observations, Conclusions." Remember? The point was that the conclusions had to be a result of the observations, and the observations had to be relevant to the method of the experiment, which in turn had to be relevant to the problem at hand.

Evidence is everything. One MUST NOT ignore evidence that disagrees with preconceived notions. If that happens, then you are no longer following scientific method and therefore science is NOT involved. if that ALWAYS happened the world would still be flat.

So how do you listen to experts?

Many will dismiss ideas (evidence) they dislike by a variety of means. Their credentials may be real, but they have betrayed them by abandoning scientific method in favour of authority. They follow, despite their credentials, some agenda other than that mandated by scientific method. With respect to fluoridation you will hear:

"The great weight of evidence supports fluoridation. The ODA, CDA CDC FDA WHO etc. support it." Unstated, usually, is the rest of that pronouncement which is, "and therefore we will dismiss or ignore any evidence to the contrary. Rather we will marginalize anyone who disagrees with us, because we have these credentials as experts and those who disagree must be nuts or quacks." (It doesn't seem to disturb them that among those weird anti-fluoridationists are a great many Phds and a Nobel Laureate or two.)

It is easy to be greatly impressed and swayed by experts with credentials. Don't be intimidated and don't be lazy. Ask yourself whether or not the scientific expert is being true to scientific method.

In this case, a true scientific expert - one fastidiously loyal to scientific method - would say the following when confronted with new (and conflicting) evidence: "The great weight of evidence, to the best of our knowledge, supports fluoridation BUT we ARE OBLIGED carefully to consider any evidence to the contrary to see if it is valid. If, instead, we were to dismiss evidence PRECISELY BECAUSE it disagrees with what we think we already know, we would no longer be scientists, and our expert opinion, as well as our credentials, would be worth nothing."

On the issue of fluoridation you will hear from many (non-scientific) "experts" with great credentials. Learn to recognize them. It's easy. They are quick to quote authority and blithely ignore or dismiss evidence. And yet they are sincere. (To explain the sincerity look up the terms "cognitive dissonance" and "confirmation bias.")

In fact, "the great weight of evidence" does NOT support fluoridation." But even that is irrelevant. Even if one valid, and VERIFIED piece of evidence cannot be explained by a theory, then the theory is wrong. A single (valid, verifiable) joker can, and should, topple the whole house of cards. You learned that in grade 5.

This one-minute YouTube video clip of Nobel Laureate Richard Feynman from 1964 says it all:

http://www.youtube.com/watch?v=b240PGCMwV0

Consider these quotations:

On conflicting evidence:
"The great tragedy of science: a beautiful hypothesis slain by an ugly fact."
Thomas Huxley (1825-1895)

Many people presenting the anti-fluoridation arguments are presenting "ugly facts" to you. Collect them. When they public health folks tell you of all the evidence SUPORTING fluoridation, feed them "ugly facts." See how they respond. DIG DEEP with your questions. Don't be put off by assurances that panels of scientific experts with political loyalties have investigated these.

Are you uncomfortable questioning PhDs and other scientific experts?

Don't be.

Are you hesitant as a sports fan to boo or cheer an elite athlete?

Why not? Can you perform at his or her level? I submit that you are comfortable criticizing these elite athletes because you understand the rules of the sport involved. You also understand the rules of science. Feel free to boo and cheer. More than that, fell obliged to boo and cheer. When "the game" of science involves your health, you are deeply involved. Sports are merely entertainment.

On "experts":
"Learn from science (read "scientific method) that you must doubt the experts...Science (read "scientific method) is the belief in the ignorance of experts."
- Richard Feynman (May 11, 1918 – February 15, 1988) 1965 Nobel Laureate in Physics

"A foolish faith in authority is the worst enemy of truth."
Albert Einstein

On marginalization:

"If the man doesn't believe as we do, we say he is a crank, and that settles it. I mean, it does nowadays, because now we can't burn him."
- Mark Twain

On Open Mindedness:
“It’s not what we don’t know that gets us into trouble, it’s what we know for sure that just ain’t so."

- Mark Twain

Sincerely,

Brian D. McLean, B.Sc. D.D.S.
Barrie, ON, Canada,
(705) 728-4016 (h)
(416) 892-4421 (c)
drmclean@bdcmclean.com

From: Tammy Gouweloos [mailto:tamfragou@xplornet.com]
Sent: Friday, March 30, 2012 7:12 PM
To: MAYOR EMAIL; Patrick Kehoe; petebowen12@gmail.co; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: JASON COVEY
Subject: letter to the mayor and council

Please see the attached letter regarding water fluoridation

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of sam57ok06@rogers.com
Sent: Friday, March 30, 2012 11:33 PM
To: JASON COVEY
Subject: fluoridation

I am totally opposed to this drug being added to our water I believe that the negative effects are being downplayed by too many I would like to see stats that not only look at population but the make up of that population that compare to our unemployed, ODSP, welfare and single mothers allowance. We have a huge demographic in these areas with a lower education level than other cities. Thus our dental caries rate would be much higher as reasonable dental hygiene is not followed. I work in a busy medical office and see so many in these categories who don't bother to brush their teeth, nor do they seem to care; they don't drink much water either. So to expose all of our citizens to a toxin in an ATTEMPT to decrease dental caries in those who may not even be exposed to the fluoride in an amount large enough to make a difference, is really questionable.

-----Original Message-----
From: info@esolutionsgroup.ca [mailto:info@esolutionsgroup.ca] On Behalf Of sam57ok06@rogers.com
Sent: Friday, March 30, 2012 11:35 PM
To: JASON COVEY
Subject: fluoridation

further to email just sent, why do you not get assist from other than the health unit, who are so obviously biased?

From: Scott Miller [mailto:scott.miller.3@gmail.com]
Sent: Friday, March 30, 2012 12:14 PM
To: MAYOR EMAIL; Patrick Kehoe; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; JASON

COVEY; Pete Bowen
Subject: MURF and Fluoride ~ The synchronicity of the two

Mayor Orsi and Council,

I hope this finds you well.

While speaking with some friends recently, we came to the conclusion that the MURF on West street and the Fluoride issue hold the same premise: Toxic risk and danger to Orillia residents.

If you are against the MURF being built on the toxic West Street brownfield, and understand how toxic fluoride is, your logic will guide you to vote NO to Fluoridating Orillia's water supply.

Thank you,

Scott Miller
241 Nottawasaga Street, Orillia
"The first wealth is health" - Ralph Waldo Emerson
705.305.2225

From: dianne orton [mailto:diniii@distributel.net]
Sent: Friday, March 30, 2012 12:24 PM
To: Tony Madden; Andrew Hill; Paul Spears; Michael Fogarty; Linda Murray; Pete Bowen; Patrick Kehoe; MAYOR EMAIL
Cc: Jason Covey
Subject: Fluoride lawsuits start and may grow massively

Please enter this information for consideration in your report to Council on the fluoridation issue.

NaturalNews) Isn`t it odd that a substance that is claimed to reduce tooth decay actually causes white spotted, yellow, brown teeth and even pitted teeth? The truth is, even for what fluoride is purported to do, it doesn`t work very well. The other truth is, dental fluorosis, or these spots or pitted teeth, is a sign of fluoride poisoning, and according to the CDC, dental fluorosis now affects 41 percent of adolescents. The sad thing about fluoride poisoning is that it goes far beyond the damage to our teeth. Consuming fluoride negatively affects our brains and bones, and fluoride has even been found to make us statically less intelligent. It`s implicated in dozens of serious diseases, and the only bright side is that consumers and the public are starting to fight back.

A lawsuit was recently filed against two companies offering water products with fluoride marketed toward children, and they're being sued for damage caused by the fluoride. The Plaintiff, a 13-year old girl, has severe dental fluorosis, and the cost to cover her white spotted teeth with veneers, over her lifetime, may be more than $100,000. Her parents actually bought the fluorinated water because it was marketed to be good for teeth - and the fluorinated water was 90 percent of the water the girl drank as a baby and young child. But you can see for yourself what happened.
http://www.nidellaw.com/press/Front.png

"In this case, a photo really is worth a thousand words," says plaintiff`s attorney Nidel pointing to a photo of the girl`s teeth.

Unfortunately there aren`t also pictures of how much of her intelligence quotient this girl lost and what further impact that will have on her life: whether it`s in income lost due to lost intelligence, kidney damage, bone damage, cancer or just in personal unhappiness. Her mother says she is extremely self conscious about her smile.

The bottled water she drank regularly contained .08 percent fluoride, which is about the same amount that municipalities add to public water supplies. The attorneys for the case think it`s just the tip of the iceberg for fluoride related lawsuits.

It also turns out that even though these parents thought that the fluoride would benefit their daughter, the dental industry has long known otherwise.

According to a firm working to end the fluoridation of our water supply, "Dental industry representatives have long fretted

in their professional journals that fluoride providers could one day face legal actions for harm caused by ingested fluorides... There were also warnings in dental and other publications that fluorides could potentially cause bone disorders, kidney harm, and thyroid impairment."

Attorney Nidel also adds, "We`re at the beginning of what looks to be an absolutely enormous wave of new fluoride litigation. There are so many harmed teenagers with fluorosis. We have the government`s own data to prove that. Potentially millions with fluorosis will want to talk to an attorney, and believe me, plaintiff attorneys and the plaintiffs` bar are beginning to educate themselves about all this."

It`s a sad thing that we have to step up and fight just not to be poisoned these days, but it`s good to see consumers fighting the battle. The city of New York may be getting on board with the ending of this massive public poisoning, and legislation has been introduced to stop fluoridation of the city`s water supplies.

More:
http://www.foodconsumer.org/newsite/Politics/34/water_fluoridation_in...
http://www.nidellaw.com/press/Front.png
http://www.naturalnews.com/030928_fluoride_mental_retardation.html

Learn more: http://www.naturalnews.com/033965_fluoride_lawsuits.html#ixzz1qcMjpAGb

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From: Justyna Lasocka Miller [mailto:justynalasocka17@gmail.com]
Sent: Friday, March 30, 2012 6:43 PM
To: JASON COVEY; capetebowen12@gmail.com
Subject: Orillia Fluoride

To the mayor of Orillia and the council,

I grow up in a similar community to this one, we didn't have fluoride in water but were told to brush out teeth
with it. Every month a nurse would come to our school and we did the brushing but were strongly advised not to swallow it!
It was supposed to reduce our cavities..... I didin´t!!!!!
Simply because our day to day hygiene was poor, our parents were not educated in that matter, and never looked after our teethe or diet.
We´ve always had lots of chocolate, sweets, treats, and were never told to brush our teeth.....and that´s were the problem was and is!
You can poison the whole community with fluoride in hope that it will reduce their cavities or you can educate people, both, parents and children.

I ask you to vote NO to fluoridation for our common water supply.

Justyna Lasocka-Miller
241 Nottawasaga

From: Lloyd Stringer [mailto:pinklloyd21@gmail.com]
Sent: Friday, March 30, 2012 10:06 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: JASON COVEY; orilliacitizensagainstfluoride@gmail.com
Subject: Please say NO to fluoridating Orillia's water.

Dear Mayor and Council,

I remember as a kid having the fluoride treatments at the dentist and having the fluoride swishes in elementary school. Both were awful and would make me feel like retching. As I got older I had heard things in passing about fluoride making teeth brittle, and that it might make you feel sick.

So when I heard about Orillia's plans to fluoridate the municipal water it made me stop and think. I did some research. What I found was very disturbing. What I learned mainly, was that fluoride was actually a very harmful chemical. I thought back to my childhood in horror that I have had this toxic stuff in my mouth many, many times. How dare they force me to do this?

I understand that there is a pharmaceutical grade fluoride which is used by dentists, but there is also this far worse toxic fluoride that is used for cities' water supplies. Honestly, I cannot understand how anyone could not see how dangerous this idea is.

Just so you know, I have two children and as a parent any threat to them is totally unacceptable. How am I supposed to protect their health and safety when it will be impossible to escape the fluoridated water? How could I let my daughter swim in the pool at the Y? I know the fluoride soaks in through the skin. Same with having a shower, playing in the sprinkler or simply having a drink of water. The fluoride should not be swallowed!

Even writing this I feel so upset that this "cure" for Orillia's dental health problems puts my kids at risk. No parent wants their kids put in harms way and in my opinion you are not allowed to put me or other parents in this position. I have a right to expect clean water for my children from the city that I live in.

Please, do your homework like I did, and look at the risks seriously, especially how they relate to children.

Please vote NO to fluoridating Orillia's water.

Thanks,
Lloyd Stringer
15 Rachael Rd, Orillia
259-1611

PS It is still March 30th, so I request that this email be submitted as part of the correspondence relating to the fluoride issue. Thanks.

From: BRUCE MILLER [mailto:brugin@rogers.com]
Sent: Friday, March 30, 2012 11:48 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Cc: JASON COVEY
Subject: Re Public Consultation Process on Fluoride

Mr Mayor, Members of Orillia Council, and Mr Covey,

While we do not live in Orillia, we are in Orillia almost every day, and thus have grave concerns about the proposed fluoridation of Orillia's Municipal water, and the discharge of that water with the inherent fluoride, arsenic and other associated toxic chemicals. We live on the shore of Lake Simcoe in Ramara Township and we endorse every means possible to clean up Lake Simcoe. Please be sure to read the comments in red below .....

Surely you are aware that the purchase of the chemical to fluoridate town water would be an act to relieve the source (fertilizer industry) of a toxic waste which by universal law cannot be discharged into any lake, ocean or other water stream - it is toxic waste unless it is sold as a product. The purchase of this toxic waste to inject in the municipal water would be an act that is totally unacceptable. Considering only 2 - 5% of the fluoride injected into the municipal water would actual

reach the intended target of tooth enamel (the remaining going to industrial processes, car washing, lawn irrigation, etc. etc.), the town of Orillia would therefore be judged to have coerced with the fertilizer industry (at the expense of those paying water bills) to dispose of toxic waste through the bodies of all who consume water in Orillia and to dispose of it on behalf of the fertilizer industry in the very lakes we are trying to clean up.

Read the WARNING label on toothpaste - THE FLUORIDE IS NOT TO BE INGESTED!!

A WARNING FOR EACH OF YOU - Beginning January, 2013, all members of council will be subject to new legislation that makes every elected member subject to a much higher scrutiny and consequently subject to legal action against them for imposing any treatment or process that is deemed harmful to those in their juridiction. Considering that major municipalities across Canada have recently removed fluoridation, (for example - over 90% in each of BC and Quebec, and Calgary and Waterloo), it is abundantly clear that those mayors and council members are risk adverse and wish to have no part in helping the fertilizer industry resolve their toxic waste dilema, and no interest in being sued for doing so. Why on earth would you want any part of this??

SOLUTION - Educate the educators - teach effective oral hygiene through all levels of education. The teaching infrastructure is in place. At very little cost and with no risk, the incidence of poor oral health can be greatly reduced, and done without subjecting anyone to the injestion of toxic waste, and without dumping this toxic waste into our precious waters. The Federal Government endorses and in fact funds measures to clean up Lake Simcoe - If Orillia dumps toxic waste into Lake Simcoe, what do you think will happen to the clean lake initiative?

VOTE NO TO FLUORIDATION OF ORILLIA'S MUNICIPAL WATER. Stand up against the very well funded and forceful lobby of the fertilizer industry. If you sincerely care about the health of all Orillian's and visitors to Orillia, and if you care about the health of our beautiful lakes and rivers, you would vote NO.
If you vote yes, I among countless others will be happy to see you all severly penalized by the pending legislation that I refer to above.

Bruce and Virginia Miller
179 Florence Avenue, Ramara Township

Barrie Dental Hygiene.ca
Healthy SMILES for a lifetime

tel: 705-722-0030
fax: 705-722-9910
info@barriedentalhygiene.ca
Tammy Gouweloos, RDH
11 Ferris Lane, Suite 306, Barrie, L4M 5N6

March 30, 2012

To: Mayor Orsi and Orillia Councillors

My name is Tammy Gouweloos, I am a registered dental hygienist, providing dental hygiene care for over 30 years, more than half of that time in the city of Orillia.

I am also a Past President of the Ontario Dental Hygienists Association and past Vice-president of the Dental Hygiene Practitioners of Ontario. I am currently on the Board of the International Academy of Biological Dentistry and Medicine and a student to become a Nutrition Practitioner.

Water fluoridation is based on "old science". It is not "safe science". Dental professionals, dental organizations and dental government agencies need to move toward, need to move out of the 1930's and into the 21st century.

The Orillia City Council needs to understand that many communities and countries are stopping "water fluoridation" because of the new research. You have heard and seen this new research from various sources and this research cannot be ignored.

As a dental professional with over 30 years experience, I have always asked the question as to why we do what we do. Through my own personal research and experience with the community of Orillia, I have seen over and over again signs of "too much fluoride" – fluorosis. There are many health risks involved with fluoride. Fluoride is available from many sources and should be given by dental professionals, not through the drinking water.

The Dental Community, I feel, is using water fluoridation as a "toxic band-aid".

New technology and new research is where the dental community needs to be directing their energies. Expecting local councils to take up their responsibility of reducing the cavity rate is irresponsible.

Water fluoridation will pollute the drinking water, the lakes and have ill health effects for the citizens of Orillia. If the Orillia Council agrees to Water Fluoridation they will be taking many steps backwards.

The previous Councils of Orillia listened to the people in their community and voted for keeping the public drinking "SAFE and CLEAN" and did not allow water fluoridation.

I strongly urge the current City Council to keep our water clean and safe, it is a precious natural resource that should not be tampered with.

Respectfully submitted,

Tammy Gouweloos, RDH

Appendix A2

To: mayor@orillia.ca; linda.murray170@gmail.com; andrew.hill@bell.net; pat@kehoeassociates.ca; pcvc@sympatico.ca; petebowen12@gmail.com; tonymadden@rogers.com; pdance@orillia.ca; mfogarty@bell.blackberry.net; jcovey@orillia.ca
Subject: Water Fluoridation pollutes our Lakes!
Date: Fri, 30 Mar 2012 13:12:24 -0300

I am a retired Engineer living near Orillia. I have been a life long Environmentalist. We support Council of Canadians, Greenpeace and other groups.

The subject of water fluoridation is the **first** that I have EVER tackled as an activist because it is so WRONG! It is an issue that is:

1. Unethical. It treats Humans, not the water!
2. A Human Rights issue - it is mass medication without our permission! The town council can do what no doctor can do!
3. Degrading to everyone's health. There are many studies that show increases in most diseases - cancer up 30% in only 2 years after introduction and a DOUBLING of hip fractures, just to name a few.
4. Ineffective - it does not work! Why go to all this trouble for very little (potential) gain? At best, fluoridation may prevent one cavity in a child's life!
5. An environmental disaster! - see below for more details.
6. Yet another failing of our Health Care System. All the way from Health Canada to local dentists/doctors, they support this UNREASONABLE practice. Anyone who speaks out against fluoridation WILL LOSE THEIR LIC. TO PRACTICE! (and a few have).

There is a group of people in Orillia that are looking deeply into this subject because the Council will be voting on it in June of this year. Fluoridation is being proposed by all levels of Gov't to help reduce tooth decay in children! The efficacy of this is questionable at best and TOTALLY ineffective according to many scientific reports. The driving force behind this is simply "TOXIC WASTE DISPOSAL", plain and simple. Hard to believe, I know!

The so called fluoride that cities purchase for water fluoridation is a level 4 toxic waste byproduct of the fertilizer industry - called Hexafluorosilicic Acid. It contains 24% fluoride, arsenic, lead, mercury and a whole host of other undisclosed toxins (up to 300!). It is NOT elemental Fluoride, it is NOT the same as used in toothpaste, it is NOT food or pharmaceutical grade, it IS "Commercial" grade. It has a ph of 1.2 - like battery acid. For the city of Orillia, with 30,000 people, they will "dispose" 88 forty-five gallon drums of this waste product that CANNOT be disposed of in any other manner. Once purchased, this toxic substance that cannot be dumped in the worlds oceans by International agreement, becomes a product and therefore gets around environmental/disposal laws.

Based on one lab analysis of a shipment of Hexafluorosilicic Acid that was shipped from Florida to the city of Toronto, the arsenic level was such that 3.5 to 56 US gallons of pure arsenic would be dumped into the water each year in Orillia, pass thru the water treatment plant completely unaltered and flow into Lake Couchiching go down stream into Georgian Bay and eventually to the ocean. The board that governs the "quality" of Hexafluorosilicic Acid for use in water fluoridation states that, in order to be "acceptable", it must contain less than 200 mg/litre of lead - implying that it could have this much lead in it. Generally, it does NOT contain this much, but the next batch shipped could!

The city of Toronto dumps approximately 533 TONS of this toxic waste into Lake Ontario each year. In Canada, approximately 7000 TONS (50% of the population is on fluoridation) is dumped (233 fully loaded semi-trucks).

Is it any wonder that our Eco-Systems are taxed to the limit!

The old saying that "the solution to pollution is dilution" is fine up to a point - but when we add up all the toxins being "diluted", the net result is JUST NOT SUSTAINABLE and has long ago passed the point of no-return.

Please, could you ensure that your position on fluoridation will not cause pollution in our precious water.

Please vote "NO" to water fluoridation!

Thank you,
Steve Goulter

Sent: Sunday, April 01, 2012 7:52 PM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,Vote against fluoridating Orillia’s water supply.

Thank you!

Neal JOHNSON
brighton, Massachusetts

North Simcoe Victim Crisis Services

Phone: 705-325-5578
Fax: 705-326-4126
Email: nsvcs@encode.com

April 3, 2012

The Mayor and Council
City of Orillia
50 Andrew Street South, Suite 300
Orillia, ON, L3V 7T5

Dear Mayor Orsi and Council:

RE: Fluoridation in Orillia Water

SupportLink Wireless Phone Program

Phone: 705-323-9260
Fax: 705-323-9869
Email: supportlink@encode.com

The matter of fluoride was discussed at our last board meeting and our Board was in favour of it being added to the Orillia water.

Our programme deals with many people who are either on some kind of assistance or low wage earners. While we understand that children whose parents receive Ontario Works or ODSP may receive free dental care, a Mom who is in crisis is likely not going to be thinking of dental care. We understand that educating people about proper hygiene would certainly help, however for a single parent struggling to get out of an abusive relationship, feeling that her life has very little worth, and that nothing she does is right, giving her kids a hug at night may be as much as she can handle and getting any kind of food on the table, let alone nutritious food, is going to suffice.

66 Peter Street South
Orillia, ON L3V 5B1
Website: www.nsvcs.on.ca

Charitable Donations No:
86976 4829 RR0001

Funding provided by:
The Ministry of The Attorney General,
Victims' Justice Fund

Those families who are the working poor are at an even greater disadvantage. They don't have any extra income to pay for a luxury like going to the dentist. Most minimum wage jobs don't offer benefits. Most of the arguments surrounding fluoride have concentrated on young children; however, we have been told that fluoride provides many benefits for seniors. Recently, we have done a number of calls with elderly people so are aware that most seniors also do not have medical benefits. Many Seniors in our community live on an extremely limited income; there is simply no money left over for dental care. We believe it is imperative that we protect the most vulnerable in our society—our children and our elderly—and this would most certainly extend to adding fluoride to our water.

Yours sincerely,

A member of ONVSP

Patricia Hehn
Executive Director

FOR YOUR INFO
DATE Apr. 10/12
TO Jason Covey

JW. Clerk's Dept

11 Tecumseth Street
Orillia, ON
L3V 1X7
April 3, 2012

Mayor and Council
City of Orillia
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5

Dear Mayor Orsi and Council:

RE: **Fluoridation in Orillia Water**

I recently had my six month check up with my dentist and asked about fluoridation in Orillia's water, expecting information about the benefits for children and was quite astonished to hear about all the benefits for seniors. I think these benefits have been overlooked in all the discussions. You may have had the dental hygienist count out numbers for the chart as they check your gum line. They are seeing how far your gums have receded, just one more sign of aging! This exposed newly exposed area is far more prone to decay. The hygienist explained to me that fluoride is really helpful in combatting tooth decay in this newly exposed area.

In my work, I am aware of the number of seniors in our community who live at or near the poverty line and thus simply do not have the extra funds to pay for luxuries like dental care.

My husband, Terry, and I would like to add our voices to those in favour of advocating that we add fluoride to the water in Orillia.

Yours sincerely,

Patricia Hehn

Terry Hehn

FOR YOUR INFO
DATE Apr. 10/12
TO Jason Covey

JN Clerk's Dept

Sent: Thursday, April 05, 2012 10:28 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; JASON COVEY
Subject: EPA (National Treasury Employees Union) Fluoride Statement

To Jason Covey, Mayor Orsi and Councillors of Orillia,

The National Treasury Employees Union, Chapter 280, of the Environmental Protection Agency has recently released a statement on Artificial Water Fluoridation. These 1600 professional employees consist of Scientists, Lawyers, Engineers, all who have made clear their concerns regarding Artificial Water Fluoridation.

Please take a few minutes and review these concerns.

http://nteu280.org/Issues/Fluoride/flouridestatement.htm

Sincerely,

Ruth Bednar

From: jeanie
To: ruth.bednar
Subject: RE: URGENT - BILL HB 1416 - Local
Date: Sun, 8 Apr 2012 21:50:16 -0400

Dear Ms. Bednar,

Thank you for your email. I've read the legislation and it seems to make sense. Unless there is compelling evidence/testimony to the contrary, I do plan to support it.

Jeanie

Sent: Sunday, April 08, 2012 8:58 PM
Subject: URGENT - BILL HB 1416 - Local

To Senators of the Public and Municipal Affairs Committee:

IT IS URGENT THAT Bill HB 1416, requiring a fluoride statement to be posted on all residential water system billing statements, IF the Water Supply is FLUORIDATED, be passed for the protection and awareness of all residents receiving Artificially Fluoridated Water.

The CDC has stated that 32% of children are affected by Dental Fluorosis a three fold increase since the 1950's. This condition is a clear indication that we are now overexposed to fluoride, as it is found in most foods and beverages as well as municipal water supplies. (See Fluoride Glut)

The US Department of Health and Human Services estimates that an adult in a fluoridated comunity ingests between 1.6 - 6.6 ppm/day of fluoride from all sources. http://health.gov/environment/ReviewofFluoride/

Gerber is now selling unfluoridated water to mix with infant milk formula. Infants blood/brain barrier is not fully developed and an inappropriate amount of fluoride may be responsible for the depression of IQ in many studies. The level of fluoride in Mother's Milk is SO LOW (.004 ppm) which is 250 times less than is found in Artificially Fluoridated Water. Bill HB 1416 is needed to warn people, especially parents of infants, that the tap water has been intentionally fluoridated so that they will be AWARE what they are using to reconstitute infant formula, and if they feel this is too much fluoride, they may purchase unfluoridated water.

Over 3,700 Doctors, Dentists, Toxicologists, Scientists, and other Health Professionals have substantiated proof of the potential dangers and have signed a statement to end AWF http://www.fluoridealert.org/professionals.statement.html

The National Treasury Employees Union, Chapter 280, of the Environmental Protection Agency has recently released a statement on Artificial Water Fluoridation. These 1600 professional employees consist of Scientists, Lawyers, Engineers, all who have made clear their concerns regarding Artificial Water Fluoridation.
http://nteu280.org/Issues/Fluoride/flouridestatement.htm

I feel that Bill HB 1416 is long overdue. I also strongly feel drinking water should be kept as pure as possible without intentionally added drugs and toxins. Isn't it our human right?

Sincerely,

Ruth Bednar
Registered Orthomolecular Health Practitioner

From: Colleen O'Neill
Sent: Wednesday, April 11, 2012 10:44 AM
To: Gayle Jackson
Subject: Letter for Council Agenda

Dear Ms. Jackson:

Please add this information to Council Agenda.

Dear Mayor Orsi and Members of Council:

RE: Fluoridation does not work to save caries PDF File

I am sending you, attached as a PDF file, a well-researched document reviewing the literature about the ineffectiveness of Water Fluoridation.

Thank you for considering this information in your decision-making process.

Sincerely,
Colleen O'Neill

Sent: Thursday, April 12, 2012 6:49 PM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,

Vote against fluoridating Orillia's water supply.

Thank you!

The UN and WHO should be involved in this. Individual governments for nations have shown to be incompetent and criminal when it comes to this issue. Please don't be one of these criminals. I firmly believe my PCOS has been caused by flouride in water, and it is known to cause calcification of pineal gland, thyroids etc. My own fertility problems aren't something I would wish upon any woman. For someone in authority to do this to their population is criminal. Hiding behind a blatant lie which is well-known to be just that is pathetic.

Phillipa Watson
Hillman, Australia

-----Original Message-----
From: Brianne Poirier
Sent: Friday, April 13, 2012 1:06 PM
To: MAYOR EMAIL
Subject: Fluoride in our water!

Mr Orsi,

I received a letter that says that the city council plans to put fluoride in our drinking water, and I am extremely unhappy about this!

First of all, fluoride is a chemical! Many people spend a lot of time and money avoiding chemicals in food and clothing for a reason, it is unhealthy and dangerous to a persons health. There is a good reason for toothpaste, which contains fluoride, to have warnings about swallowing. It can make a person sick. Also, because it is a chemical, pregnant women and children especially can be hurt by ingesting it in water.

People trust drinking water. We may take it for granted, but people expect tap water to be relatively clean and healthy! I personally keep a bottle of water next to my bed for while I am reading or if I wake up and am thirsty. I use the tap water in a reusable bottle on a daily basis.

I am a university student at Lakehead in Orillia, and I use drinking water from a tap for a cheap and healthy way to stay hydrated. I do not have money to buy expensive water in glass bottles in order to avoid chemicals from plastic bottles or even the tap water itself.

Please do not add fluoride to our water, if it is added, I promise that my first time voting will be for someone who is completely against this and I will make sure to let my friends know about your decision to allow the fluoride to be added to our water.

Thank you for your time in reading my email,

Brianne Poirier

Sent: Friday, April 13, 2012 9:19 PM
To: MAYOR EMAIL; Pete Bowen
Subject: flouridated water in Orillia

Hi Angelo, just a quick note to let you know that I feel very strongly that Orillia should not flouridate our water. I think that teaching proper nutrition and dental care is the route to be taken. As far as I am aware there are programs available for families who cannot afford dental costs. I feel that our individual choices would be taken away if flouride were added to our water. I know for one that I do not want the risks associated with this type of flouride for myself or my children. I am also concerned for the environmental effects it could have on our lakes. I thank you for considering my and a lot of other's concerns regarding this issue. Let's face it, we get enough in the toothpastes we use anyway.

Sincerely,

Meredith Warboys

Sent: Sunday, April 15, 2012 11:27 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Fluoridation

Yes we are very much againt Fluoridation in our Orillia water.
Gerry & Miriam Pringle

From: Alan Malloch
Sent: Sunday, April 15, 2012 2:11 PM
To: MAYOR EMAIL
Subject: Water Fluoridation

I received a leaflet in the mail box from OCAF. This states that the fluoridation process council is considering does not meet NSF standard 60 and would violate the Safe Drinking Water Act, Ontario.

If this is the case I would be extremely concerned that Council consider using this process - perhaps you could clarify this issue.

We have always been very unsatisfied with our water as it is - far too much lime etc which damages appliances and gives them a shorter life - it is also at present not very nice to drink. Isn't there something Council could be doing about this at source. I would happily pay an extra few dollars on the house taxes to have better drinking water straight from the tap.

I look forward to your comments.

Irene Malloch

From: don porter
Sent: Sunday, April 15, 2012 10:44 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Request from Don Porter

Hello everyone,

I know you will not believe it but here goes.
I was speaking with my dentist and he asked me if I knew anyone on Orillia council. lol

Long story short he was asked to do a presentation on the Fluoridation debate and wanted my opinion on the way he would be greeted.
That was a month ago and at my appointment this week I was informed that the against fluoridation side would only get 15 minutes so his presentation would not be needed.

I am a little disappointed that the pro fluoridation side has had some significant time in planning and presentation and the opposing side has been cut back to 15 minutes of fame.

I asked him to send me his letter and I would ask council to at least read it.

Upon receipt of the email I found all of your email addresses attached which leads me to believe you may have already seen it.
In any case I will send it along and ask that you please read my dentist's opinion.

I will preface this by telling you that my dentist is a little odd.
He is very outspoken about mercury as well and made me watch his "mercury fillings leaching mercury" video the first time I met him.
Personally I like him and think he is a really good dentist.

So here is his letter.

Thank you
Donald Porter

Attachment:

Dear Mayor and Council Members:

Several years ago the town of Huntsville here In Ontario was considering discontinuing fluoridation. City Council referred the issue to a sub-committee to flesh out the issue and make a recommendation to the full council. My understanding is that Huntsville commenced fluoridation decades ago largely at the instigation of my colleague and friend, Dr. Rick Riley, now retired. I didn't know Rick at the time, but if I had I would have supported him. That is how we were trained. That is what we believed.

Since that time, Rick changed his mind. Independently of Rick, so did I. A few years ago Rick had the opportunity to try to end the fluoridation he "started." He asked me, with others, to present to the sub-committee. Later, at the public meeting of the council, many issues were discussed and on ALL of them, except the last, any member of the public was invited to comment before a vote was taken. Many did. The last issue was the discontinuation of fluoridation. The fact finding sub-committee made their recommendation to discontinue fluoridation. Then the mayor asked for input from the dental public health officer who had NOT made a presentation to the sub-committee although several pro-fluoridation dentists had done so.

His "words of wisdom" were that the dose makes the difference. He meant that high doses of fluoride are used to kill rats, but that low doses were safe and beneficial. The sub-committee already knew that. They understood that the dental public health officer was referring to the toxicology of ACUTE RATHER THAT CHRONIC poisoning. They also knew that low doses of a fluoride that ACCUMULATE in the body are not safe.

Intriguingly, the mayor did NOT ask for any further input from the public (unlike every other issue on the agenda) but instead immediately called for a vote, and fluoridation was NOT discontinued.

My impression was that the issue had been decided BEFORE the subcommittee had been created and the whole rigmarole was just "democratic window dressing."

If that was not the case then the full council was really impressed by the 15 second presentation of this "expert" and had sweet little respect for the intellect of their colleagues on the sub-committee who had spent many, many hours investigating the issue.

Beware of experts!!

How, then, do you make a rational decision without expert advice?

You don't.

But you need to be able to recognize when a scientific "expert" is talking politics and when she is talking science.

I do NOT mean to imply that the public health experts advocating fluoridation are insincere or the least bit dishonest. They are just passing on what they believe to be the truth. That is the case, for instance, of most dentists. They believe what they were taught in dental school. So did their professors. Do did I.

The issues of fluoridation and other public health matters are supposed to be driven by science. Mostly they are not. They are driven by dogma.

Outrageous?

Science means, by definition, adherence to scientific method. You learned scientific method in grade 5 or so. You wrote about "Purpose, Apparatus, Method, Observations, Conclusions." Remember? The point was that the conclusions had to be a result of the observations, and the observations had to be relevant to the method of the experiment, which in turn had to be relevant to the problem at hand.

Evidence is everything. One MUST NOT ignore evidence that disagrees with preconceived notions. If that happens, then you are no longer following scientific method and therefore science is NOT involved. if that ALWAYS happened the world would still be flat.

So how do you listen to experts?

Many will dismiss ideas (evidence) they dislike by a variety of means. Their credentials may be real, but they have betrayed them by abandoning scientific method in favour of authority. They follow, despite their credentials, some agenda other than that mandated by scientific method. With respect to fluoridation you will hear:

"The great weight of evidence supports fluoridation. The ODA, CDA CDC FDA WHO etc. support it." Unstated, usually, is the rest of that pronouncement which is, "and therefore we will dismiss or ignore any evidence to the contrary. Rather we will marginalize anyone who disagrees with us, because we have these credentials as experts and those who disagree must be nuts or quacks." (It doesn't seem to disturb them that among those weird anti-fluoridationists are a great many Phds and a Nobel Laureate or two.)

It is easy to be greatly impressed and swayed by experts with credentials. Don't be intimidated and don't be lazy. Ask yourself whether or not the scientific expert is being true to scientific method.

In this case, a true scientific expert - one fastidiously loyal to scientific method - would say the following when confronted with new (and conflicting) evidence: "The great weight of evidence, to the best of our knowledge, supports fluoridation BUT we ARE OBLIGED carefully to consider any evidence to the contrary to see if it is valid. If, instead, we were to dismiss evidence PRECISELY BECAUSE it disagrees with what we think we already know, we would no longer be scientists, and our expert opinion, as well as our credentials, would be worth nothing."

On the issue of fluoridation you will hear from many (non-scientific) "experts" with great credentials. Learn to recognize them. It's easy. They are quick to quote authority and blithely ignore or dismiss evidence. And yet they are sincere. (To explain the sincerity look up the terms "cognitive dissonance" and "confirmation bias.")

In fact, "the great weight of evidence" does NOT support fluoridation." But even that is irrelevant. Even if one valid, and VERIFIED piece of evidence cannot be explained by a theory, then the theory is wrong. A single (valid, verifiable) joker can, and should, topple the whole house of cards. You learned that in grade 5.

This one-minute YouTube video clip of Nobel Laureate Richard Feynman from 1964 says it all:

http://www.youtube.com/watch?v=b240PGCMwV0

Consider these quotations:

On conflicting evidence:
"The great tragedy of science: a beautiful hypothesis slain by an ugly fact."
Thomas Huxley (1825-1895)

Many people presenting the anti-fluoridation arguments are presenting “ugly facts” to you. Collect them. When they public health folks tell you of all the evidence SUPORTING fluoridation, feed them “ugly facts.” See how they respond. DIG DEEP with your questions. Don’t be put off by assurances that panels of scientific experts with political loyalties have investigated these.

Are you uncomfortable questioning PhDs and other scientific experts?

Don't be.

Are you hesitant as a sports fan to boo or cheer an elite athlete?

Why not? Can you perform at his or her level? I submit that you are comfortable criticizing these elite athletes because you understand the rules of the sport involved. You also understand the rules of science. Feel free to boo and cheer. More than that, fell obliged to boo and cheer. When "the game" of science involves your health, you are deeply involved. Sports are merely entertainment.

On "experts":
"Learn from science (read “scientific method) that you must doubt the experts...Science (read “scientific method) is the belief in the ignorance of experts."
- Richard Feynman (May 11, 1918 – February 15, 1988) 1965 Nobel Laureate in Physics

"A foolish faith in authority is the worst enemy of truth."
Albert Einstein

On marginalization:
"If the man doesn't believe as we do, we say he is a crank, and that settles it. I mean, it does nowadays, because now we can't burn him."
- Mark Twain

On Open Mindedness:
“It’s not what we don’t know that gets us into trouble, it’s what we know for sure that just ain’t so."
- Mark Twain

Sincerely,

Brian D. McLean, B.Sc. D.D.S.
Barrie, ON,

April 16, 2012.

Mayor Angelo Orsi,
City of Orillia,
50 Andrew Street, Suite 300

Orillia, ON L3V 7T5

Dear Mayor Orsi:

Email: Mayor@orillia.ca

Re: Water Fluoridation

Dear Mayor Orsi:

I wish to support the implementation of water fluoridation in Orillia. The use of fluoride in drinking water has been recognized as one of the greatest public health achievements of the 20th century by the U.S.Centre for Disease Control. It is a safe and effective means of preventing dental decay.

I am sure that you are well aware of the impact of poor oral health on children, adults and seniors in our community, especially upon low-income groups. There is a much higher incident of tooth decay for children living in Simcoe County than in areas with fluoridation. This can affect eating habits, growth and development. Tooth decay is not pleasant at any age, and can lead to or aggravate existing health conditions.

Please do support the implementation of water fluoridation in Orillia.

Yours sincerely

Lorraine Baycroft,
516 West St. S., Orillia.
and
Jennifer MacDonald,
516 West St. S., Orillia.

From: Merry-Lee Parnham
Sent: Monday, April 16, 2012 9:20 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Andrew Hill; Tony Madden
Subject: Please DON'T Flouridate our Water!

To whom it may concern;

Flouride consumption should be a "Personal Choice". It should NOT be added to our water.

Putting it on your teeth by "choice" (ie. toothpaste or a dentist's appication) is one thing; ingesting it on a continuous basis is another.
The toothpaste companies warn that you should not swallow their product. There is a reason for that....it can poison you.

The last time I had a flouride treatment at the dentist I was sick before I left the office....I felt awful.

Most of us have or use filters to take chemicals out of our water; why would you put more chemicals in?

There are much better ways to spend the city's money.....

Thank you for your time,

Merry-Lee Parnham

From: HELEN PERRY
Sent: Monday, April 16, 2012 9:41 AM
To: MAYOR EMAIL; Paul Spears; Patrick Kehoe; Linda Murray; Andrew Hill; Peter Bowen; Tony Madden; Michael Fogarty
Subject: Water Fluoridation for Orillia

I would like to support the implementation of fluoridation for the City of Orillia.

I Chair the James' Place Committee at St. James' Anglican Church, and we see many people who need assistance - dental health is often an underlying problem, and there is simply no priortiy given by individuals who are struggling with daily costs of food and housing. The working poor rarely have dental health coverage.

Children who live in areas with fluoridation in their water have a much lower incidence of dental decay than children living in our area. Tooth decay is painful, may impede growth and developemnt and can lead to long term health issues.

Please do implement this program, highly endorsed by dental professionals, the Simcoe Muskoka District Health Unit, and people like me.

Thank you!

Helen Perry

Sent: Monday, April 16, 2012 1:16 PM
To: MAYOR EMAIL
Cc: Michael Fogarty; Paul Spears
Subject: Fluoridation of Orillia Water

Your Worship and Councillors Fogarty and Spears

Please DO NOT support adding fluoride to our municipal water system. The Dental Association, which makes their claims that it is safe, are not paying attention to those who have researched this for many years. If some of the citizens of Orillia want fluoride, just buy the toothpaste that has it added. Why put a poison into our bodies hoping it will only affect the teeth. This issue is very important to our long term health and I respectfully ask that you vote NO.

Marian Bennett
Orillia, On

Sent: Monday, April 16, 2012 5:01 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Fluoridation

To all on city council:

Don't Fluoridate my water !!!!!!!!!

Offer and Promote - dental hygiene education
- nutrition information
- healthy food programs

don't fluoridate

Linda Barnett

From: Judi
Sent: Monday, April 16, 2012 5:53 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Please DO NOT FLOURIDATE My Water

Dear Mayor and Councillors

Please DO NOT flouridate Orillia water. I am proud of our water and it tastes great right from the tap. I will no longer be able to drink Orillia water if you make this foolish decision.

Please do NOT drug our water.

Judi McIntyre
Orillia, ON

Sent: Monday, April 16, 2012 6:50 PM
To: MAYOR EMAIL
Cc: Patrick Kehoe
Subject: fluoridate

To: Mayor Angelo Orsi
Ward 1 Patrick Kehoe

As an Orillia resident since 1977 we urge you not to Fluoridate our water. As you know there are many studies which show the negative effects and the lack of any benefit to dental care. There are many was to promote dental care and water fluoridation is not one of them.
DO NOT FLUORIDATE OUR WATER

Jim and Amy Telford

From: Susan Goodger
Sent: Monday, April 16, 2012 8:13 PM
To: JASON COVEY
Subject: Fluoride

I believe you are taking feedback for the consultation process with respect to the City of Orillia adding fluoride to the water system. I would like to cast my 'vote' and say that I am 100% AGAINST it.

Due to a medical conditon caused by a severe reaction to antibiotics, I am very sensitive to chemicals in the environment; you could perhaps consider my warning as the yellow canary in coal mines, used decades ago. I often react to certain chemical agents before people realize it is taking a toll on their body. I can't tolerate fluoride in any form; for instance, my skin turns bright red when exposed to fluoridated water. I believe it is false economy to prevent cavities now when in the long run this chemical could cause serious health problems. If people really want it, let them buy toothpaste containing fluoride!

Thank you for your attention.

Susan Goodger
Orillia, Ontario

From: Alan Malloch [mailto:amalloch01@sympatico.ca]
Sent: Tuesday, April 17, 2012 9:46 AM
To: Donna Cardinell
Subject: Your response regarding Fluoridation issues

Good morning Donna

Thank you for your reply - while I accept that there was a 30 March deadline (which I did not realise), my email was actually asking for a confirmation/denial in relation to the legality of the fluoridation (NSF Standard 60, Safe Drinking Water Act, Ontario) - this was related to a leaflet I had received through the door a few days ago.

My other issue was regarding the quality of the water at present - its bad taste and hardness, lime etc.

I thank you for your prompt reply and trust that you passed my complete e-mail on to the Water Department - hopefully I will in due course receive a comment/reply from them.

Irene Malloch

From: James Bentley
Sent: Tuesday, April 17, 2012 10:21 AM
To: MAYOR EMAIL
Subject: NO

Please do not fluoridate my family's water.The time for this is long past even considering in my opinion.

James Bentley
Orillia

From: dianne orton [mailto:diniii@distributel.net]
Sent: Tuesday, April 17, 2012 12:42 PM
To: Pete Bowen; Paul Spears; Michael Fogarty; Linda Murray; Andrew Hill; MAYOR EMAIL; Tony Maddan
Cc: Jason Covey
Subject: The Hamilton Spector - Fluoride discussion takes a bite out of City Hall

http://www.thespec.com:80/news/local/article/706566--fluoride-discussion-takes-a-bite-out-of-city-hall

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Sent: Tuesday, April 17, 2012 1:46 PM
To: MAYOR EMAIL
Subject: Don't Fluoridate My Water Please!

Dear Sir,

Please be advised that my wife and I are against fluoridation of the water supply.

Yours truly,

Joe and Joyce Seguin
Orillia, Ontario

From: Linda
Sent: Tuesday, April 17, 2012 4:17 PM
To: MAYOR EMAIL; Michael Fogarty; Paul Spears; Patrick Kehoe; Pete Bowen; lindamurray170@gmail.com; Andrew Hill; Tony Madden; thegardys@hotmail.com

Cc: JASON COVEY; Peter Dance; Percival Thomas
Subject: Water Fluoridation

Please, Orillia City Council members and Public Works officials, view this important video - http://www.youtube.com/watch?v=HiCcOL3f1Mo, regarding the Tecumseh, Ontario Council special meeting on water fluoridation - Feb. 29, 2012. In it, the Medical Officer of Health, Dr. Heimann, states that the Precautionary Principle applies, if he cannot provide evidence of safety. Also, Windsor Utilities Commission (WUC) administration confirms that there are no toxicology safety studies on hydrofluorosilicic acid. This is the chemical that is added to most municipal drinking water supplies. WUC supplies Tecumseh's water. Tecumseh and the WUC each voted to recommend to Windsor City Council that it cease water fluoridation.
If there are no safety studies, this chemical does not meet NSF Standard 60, which it is required to meet. Also, this means that hydrofluorosilicic acid violates the Safe Drinking Water Act, 2002.

Linda Upper,
Orillia.

From: marilyn goulter
Sent: Wednesday, April 18, 2012 12:06 PM
To: thegardys@hotmail.com
Subject: Water Fluoridation in Orillia

Mr. Wayne Gardy:

I welcome you as a new member of Council.
I am sure you are aware of the many difficult decisions that Council will have to make in the near future. I have the utmost respect for people like yourself that get involved in helping to manage our future direction as a Councillor. Congratulations on your new appointment and I wish you well in this endeavor.

As a way to help you get a handle on the subject of Water Fluoridation, I would like to present my thoughts on the subject - see a copy of a "letter to the editor" below. I am a retired Engineer and have researched this topic extensively for many years. When I found out that the City of Orillia was considering water fluoridation, I have taken an active part in trying my best to educate people as best I could, knowing that if people from any walk of life have all of the facts/truth about a particular topic, they can then decide for themselves to take the "yes" or "no" side. A aspect of life in our modern world that really bothers me is the fact that very few people seek out the "total picture" before jumping on the band wagon with the most appeal, or the most "comfortable" side, or the most powerful lobby. We all must be very careful and be very well informed before taking any particular side on any issue and we must then do the right thing for all of man-kind. To focus on one tiny beneficial aspect and ignore the many other sides of an issue is how our world got so messed up in the fist place! I feel confident that this will be your approach also - it is what people expect of an elected Official.

On the subject of Water Fluoridation, I would like to offer help in any way that I can. I have a very large data base on this subject - scientific reports, articles, references, books and many contacts with other people that you could consult if you so wish. I myself feel strongly against Water Fluoridation - to the point that for the first time in my life, I have become an activist. I AM NOT ASKING YOU TO TAKE MY SIDE ON THIS - I ASK ONLY THAT YOU EXAMINE ALL THE ARGUMENTS BEFORE TAKING A SIDE!

If you would like to discuss this topic further, or would like more information, I would be happy to assist in any way that I can. Please know that I am offering to be a resource that you can call on - I am willing to help in any way that I can.

Thank you for your consideration in this topic.

Please note that I am also sending this to all Council Members, as the Newspapers often cut the article back a bit in order to meet space considerations - and I would like you all to see the full message.

Steve Goulter

Attachment:

Letter to Editor - Packet Times and Orillia Today;
In the past two months I have talked to hundreds of people in Orillia about water fluoridation and I am shocked to find that most people do not know anything about it, and certainly don't know that the Municipal Council is considering introducing it to Orillia.

How can it be legal for City Council to vote on this? Fluoride is put in water with the express purpose of treating dental cavities - not to make the water safer to drink, but to treat a disease - it is a drug. How is it possible that our Orillia City Council, or our friends and neighbours (in a referendum), can vote on giving us a drug against our will? How can Council do what no Doctor can do?

Fluoride is not beneficial to bodily processes: it is a powerful antagonist to essential nutrients such as iron, selenium, iodine, calcium, magnesium, and vitamins D, E, and C. As well, it occupies Thyroid cell membrane receptor sites, inhibits mitochondrial enzymes, and reduces cellular production of ATP (upon which all bodily processes and life functions depend).

If we're not supposed to swallow fluoride, as it reads on our toothpaste tubes and boxes, why is it being put in our water? More alarming is the fact that the Fluoride source used to fluoridate water is very different than that used in toothpaste - it is a toxic waste by-product of the Fertilizer Industry called Hexafluorosilicic Acid. It is co-contaminated with mercury, lead, arsenic, radionuclides and up to 300 other substances. Health Canada agrees that no "health harm research" has ever been properly conducted on it. To "DUMP" this extremely toxic substance into "DRINKING WATER" makes no sense to me at all!

Odder still is that our water supply is such a poor vehicle for the delivery of fluoride. We drink very little of our drinking water - less than 1% is actually consumed. The rest goes on lawns, in washing machines, and down toilets and drains. That's $99 of every $100 of our money wasted. And the budget to do this does not yet exist - expect your taxes to go up if this goes through!

Let's Recap: Water fluoridation wastes 99% of the money that would be spent on it, employs a toxic waste - without health harms research, that will hurt our water quality, is used as a drug, without our informed consent, voted on by laypeople, that harms bodily processes, and should not be swallowed in the first place.

As if all that is not bad enough, think about the impact to our Environment - dumping 16,000 litres per year of this toxic material (which is comparable to mercury and arsenic on the toxicity scale) into our lake is totally irresponsible!

This should send you immediately to your email or your phone demanding that Orillia City Council not fluoridate our water! Please help stop this. We are fortunate - many cities in Canada have removed fluoridation in recent years - lets not allow it to happen in the first place!

Steve Goulter

Sent: Wednesday, April 18, 2012 2:20 PM
To: Clerks Internet Email

Subject: Community Water Fluoridation
Importance: High

Please see the attached letter regarding the community water fluoridation debate in Orillia.

Melinda Brandon
VQRP Coordinator
North Simcoe Victim Crisis Services
705-325-5578

Attachment:

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON
L3V 7T5

RE: Public Consultations on Community Water Fluoridation in Orillia

Dear Mayor Orsi and Council;

I am writing to you to express my support *in favour* of City Council's implementation of community water fluoridation. This is a very important step that I believe the City of Orillia has taken far too long to implement. Fluoride is a major component in attaining healthy teeth, both in children and adults. It is critical in the development of teeth for babies.

In 1983, I moved to Orillia and was stunned to learn that the drinking water was not fluoridated. It was not long in proving to me just how important it is to your overall health. I began to get cavities which were new experiences for me. Having in the past, lived in communities that had fluoride added to the water system; I had not experienced the pain of cavities nor the cost to repair them. In addition to the cavities I began to get more colds and illnesses than previous years and had a general feeling of being unwell; this was due to the bacteria, from the cavities, going through my system. With fluoridated water and far fewer cavities, people in general are healthier which decreases use of our health care system by reducing the number of illnesses. The benefits far outweigh any affects that the community may be fearful of.

After my move here and consulting a dentist, I purchased fluoride tablets as recommended by him as well as The Canadian Dental Association. Once I had children, I began them on the fluoride drops daily and then eventually chewable tablets. Then every 6 months, like so many others, it is off to the dentist for a check-up, cleaning *and* Fluoride Treatment!

Another point to consider is that we have a significant number of low income families in our community who cannot afford to purchase the fluoride tablets at the pharmacy for their families. It would be more beneficial to have Community Water Fluoridation program as opposed to families paying the price with the pain of cavities they cannot afford to restore.

Thank you for taking the time to read this letter and considering my view point when making your decision. It is time!!!

Respectfully

Melinda Brandon

-----Original Message-----
Sent: Wednesday, April 18, 2012 8:51 PM
To: Percival Thomas, MAYOR EMAIL
Subject: Adding Fluoride to drinking water

I'm not a resident of Orillia but heard several weeks back (via radio station 105.9) that you were considering the addition of Fluoride to your water supply.

In my opinion that would be a tragic mistake. Fluoride the so called cavity preventer, is highly toxic to the human body. To what extent you might ask? More than lead and less than arsenic. Today's primary exposure is while visiting the dentist (fluoride rinse or during polishing (called a fluoride varnish)). Other sources of exposure include common toothpaste and many municipal water supplies.
Dentist's who are the main proponent of fluoride, state it prevents or reduces cavities. Despite the lack of scientific evidence, dentistry school teaches it's students fluoride prevents cavities. Were's the proof?
Scientic facts I've reviewed tell a different story. It has been proven to hinder brain development and reduce IQ. Hopefully your well aware of what I've stated. Either way, check out the following site which explains the facts better than I.

Make the correct choice, don't poison the residents of Orillia!

-----Original Message-----
Sent: Wednesday, April 18, 2012 9:04 PM
To: John Hoos
Subject: Fluoride addition to water supply

Hi John,

I'm not a resident of Orillia but heard several weeks back (via radio station 105.9) that you were considering the addition of Fluoride to your water supply.

In my opinion that would be a tragic mistake. Fluoride the so called cavity preventer, is highly toxic to the human body. To what extent, more than lead and less than arsenic. Today's primary exposure is while visiting the dentist (fluoride rinse or during polishing (called a fluoride varnish)). Other sources of exposure include common toothpaste and many municipal water supplies.
Dentist's who are the main proponent of fluoride, state it prevents or reduces cavities. Despite the lack of scientific evidence, dentistry school teaches it's students fluoride prevents cavities. Is there concrete proof? Scientific facts I've reviewed tell a different story. It has been proven to hinder brain development and reduce IQ. Hopefully your well aware of what I've stated. Either way, check out the website below which explains the facts far better than I.

Make the correct choice, don't poison the residents of Orillia!

Regards,

Glenn c/o Holland Landing

http://www.fluoridealert.org/

Sent: Thursday, April 19, 2012 12:00 PM
To: Andrew Hill; Linda Murray; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; MAYOR EMAIL; Gayle Jackson
Subject: Flouridation City of Orillia Water Supply

To: Mayor and Council:

We are oppopsed to having fluoride put into our city water supply. We urge you to defeat this proposal shoukld it come to council for a decision.

Thank you

Wenda Hunter and Bob Hunter
Orillia, ON

From: glenn
Sent: Thursday, April 19, 2012 7:56 PM
To: Percival Thomas
Subject: RE: Adding Fluoride to drinking water

Percival,

Dr. Bill Osmunson has done the research. Please watch the clip below and google his name for more results.

http://www.youtube.com/watch?v=_Ys9q1cvKGk

Thanks for your consideration.

Glenn Jones,
Holland Landing, Ont

From: blair hodgkinson
Sent: Friday, April 20, 2012 9:25 AM
To: MAYOR EMAIL
Cc: Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: I oppose fluoridation of Orillia water

Dear Mayor and Councillors of Orillia:

On consideration of the risks and costs associated with fluoridation of city water, with which you should also be familiar from your own research and information circulated by Orillia Citizens Against Fluoride, I oppose fluoridation and ask youinstead to spend Orillia tax dollars to address the causes of dental issues in Orillia and Simcoe County, or to support programmes which offer and promote dental hygiene education, nutrition, healthy food, etc.

Thanks for considering my opinion in this matter.

Sincere Regards,

Blair Hodgkinson
Orillia, ON

Sent: Saturday, April 21, 2012 2:29 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Please do not Flouridate my Water !!!!

Good Afternoon

I thought I would take this opportunity to ask each of you directly to do the correct thing and NOT add Fluoride to Orillia's drinking water.

In the past election Orillians voted overwhelmingly towards change - meaning intelligent change. This is an excellent opportunity for you to lead our city directly out of this ridiculous idea.

Please do the right thing and say NO.

Thank you

Kevin Leatherdale
Orillia ON

Sent: Saturday, April 21, 2012 3:05 PM
To: Elizabeth Martel
Subject: Fluoridation

As a concerned citizen , I strongly object to having fluoride added to my drinking water.

In order to avoid all the chemicals and additives in processed foods, my husband and I avoid using pre-packaged foods of any kind and try to eat fresh, whole, and as much as possible local produce.
At present, we use large containers to let our water sit over night in order to let the chlorine dissipate.

I would deeply resent the city adding a chemical to the water which I believe would be harmful to ingest.....and for which the longterm effects, on our children in particular, are not known.

There are many alternative ways to promote dental health without infringing on the rights of the entire populace.

Sincerely,
ELizabeth Martel
Orillia

Date: Sun, 22 Apr 2012 21:39:12
To: <mayor@orillia.ca>; <pat@kehoeassociates.ca>; <petebowen12@gmail.com>; <linda.murray170@gmail.com>; <mfogarty@bell.blackberry.net>; <pcvc@sympatico.ca>; <andrew.hill@bell.net>; <tonymadden@rogers.com>; <thegardys@hotmail.com>
Subject: Dear Mayor and Councilors- Are any of you attending this Formal Public Consultation on the Drinking Water Source Protection Plan - Act for Clean Water?

Dear Mayor and Councilors of the City of Orillia

Are any of you attending this Formal Public Consultation on the Drinking Water Source Protection Plan - Act for Clean Water?

If you are considering fluoridation of our water supply then I believe you should consider attending this venue as 98 to 99% of the water that we do not drink will end up in our lakes.

The Venue is on Tuesday, April 24, 5:30 pm to 8:30 pm, Best Western Mariposa Inn 400 Memorial Avenue, Orillia

If you'd like to attend this Open House, please RSVP in advance by calling (416) 536-7653 <tel:%28416%29%20536-7653> or e-mailing swp@ourwatershed.ca <mailto:swp@ourwatershed.ca>

Please, I hope to see some of you there.

Best regards

Lynn Martin

Here is the information:

Link: http://www.ourwatershed.ca/documents/source_protection_plan/public_consultation.php

Formal Public Consultation on the Source Protection Plan

The Draft Proposed Source Protection Plan and Explanatory Document are now available and we're seeking public input. These documents contain policies that may impact property owners. This public consultation period takes place from March 26, 2012 to May 25, 2012.

How to get a copy of the documents

1. Download a copy now
Draft Proposed Source Protection Plan
http://www.ourwatershed.ca/assets/downloads/spp/draft_proposed_source_protection_plan_first_formal_consultation.pdf
Explanatory
Document http://www.ourwatershed.ca/assets/downloads/spp/explanatory_document_first_formal_consultation.pdf
- Pre-Consultation Comments and the SPC
response http://www.ourwatershed.ca/assets/downloads/spp/pre_consultation_comments_response.pdf

2. Request a DVD version

If you would like a DVD version of the documents sent to you, please contact Susan Jagminas at 905 895 1281 ext 264 <tel:905%20895%201281%20ext%20264> or send an e-mail to swp@ourwatershed.ca <mailto:swp@ourwatershed.ca> and provide your full name and mailing address including postal code and phone number.

3. Hard copies are available for viewing

The documents are also available for public viewing at the following locations during regular business hours:

Lake Simcoe Region Conservation Authority, 120 Bayview Parkway, Newmarket Nottawasaga Valley Conservation Authority, 8195 Concession Line 8, Utopia Severn Sound Environmental Association, 67 Fourth Street, Midland 4. Come to one of our Open Houses

All members of the public are welcome to attend to meet with staff and source protection committee members to review the documents and ask questions.

Monday, April 16, 2012, 5:30 pm to 8:30 pm, Brooklea Golf & CC, 8567 Highway 93, Midland Thursday, April 19, 2012, 5:30 pm to 8:30 pm, Holiday Inn Express, 100 Pony Drive, Newmarket Saturday, April 21, 2012, 11 am to 2 pm, Liberty North, 100 Caplan Avenue, Barrie Tuesday, April 24, 5:30 pm to 8:30 pm, Best Western Mariposa Inn,Orillia Each Open House offers the same information and is divided into two sessions to enable you to choose the time that best fits your schedule.

If you'd like to attend an Open House, please RSVP at least one week in advance by calling (416) 536-7653 <tel:%28416%29%20536-7653> or e-mailing swp@ourwatershed.ca <mailto:swp@ourwatershed.ca>

Note that there may be other Open Houses in locations that might be more convenient for you. Please click on this link for details (pdf).

How to Submit Written Comments

Deadline for written comments is Friday, May 25, 2012 at 4:30 pm. You can use this form to submit your comments or you can write your comments down in a letter and send it to:

Attention: Source Protection Committee
c/o Lake Simcoe Region Conservation Authority
120 Bayview Parkway, Box 282
Newmarket, Ontario L3Y 4X1
fax: 905-853-5881 <tel:905-853-5881>
email: swp@ourwatershed.ca <mailto:swp@ourwatershed.ca>

Sent: Monday, April 23, 2012 9:10 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Don't add fluoride to our water!

Esteemed Councillors and Mayor:
Please don't add fluoride to Orillia's water supply. This is something that each citizen should be able to decide on for him/herself. I don't want to consume drugs in my water. The benefits simply do not outweigh the costs. Please do not add anything to our water. Thank you!

Richard Clark
Orillia, ON

-----Original Message-----
Sent: Monday, April 23, 2012 10:51 AM
To: JASON COVEY
Subject: "No!" to fluoridation

To whom it may concern,
As a Registered Nurse with background in community health, I believe there are few, if any benefits to adding fluoride to our water supply. I believe my tax dollars should be spent promoting oral health and dental hygiene programs throughout our community.
Healthy nutrition and food programs would contribute to better oral health with our community. Most importantly, we, as a community should be promoting healthy oral hygiene and utilizing the (provincial) Healthy Smiles program. Attempting to fluoridate Orillia's water is a 'band-aid' approach to larger, more concerning problem.
Dental caries and oral health affect a person's overall well-being; fluoridating our city's water will NOT solve the problem(s) of poor oral health or dental caries within our community. Informing, educating and collaborating with our community about oral health and the Healthy Smiles program would be beneficial. Please do NOT fluoridate my water!
Sincerely,
Sarah Haskett, RN, BScN(Hons), citizen of Orillia

From: Sarah Haskett
Sent: Monday, April 23, 2012 11:00 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: water

To Orillia City Council,

As a Registered Nurse with background in community health, I believe there are few, if any benefits to adding fluoride to our water supply. I believe my tax dollars should be spent promoting oral health and dental hygiene programs throughout our community.

Healthy nutrition and food programs would contribute to better oral health with our community. Most importantly, we, as a community should be promoting healthy oral hygiene and utilizing the (provincial) Healthy Smiles program. Attempting to fluoridate Orillia's water is a 'band-aid' approach to larger, more concerning problem.

Dental caries and oral health affect a person's overall well-being; fluoridating our city's water will NOT solve the problem(s) of poor oral health or dental caries within our community. Informing, educating and collaborating with our community about oral health and the Healthy Smiles program would be beneficial. Please do NOT fluoridate my water!

Sincerely,

Sarah Haskett, RN, BScN(Hons), citizen of Orillia

-----Original Message-----
From: Judy Archer
Sent: Monday, April 23, 2012 3:25 PM
To: MAYOR EMAIL
Subject: NO to fluoridation

Dear Mr Orsi,
Please so not floridate our water. Fluoride is a toxic waste product that we do not want in our bodies. If the toothpaste companies advise us not to swallow the toothpaste with fluoride in it why would we want to drink the water with fluoride in it.

Sincerely,
Judy Archer,
Orillia

-----Original Message-----
Sent: Monday, April 23, 2012 4:15 PM
To: JASON COVEY
Subject: Flouriation of Water

I am opposed to the flouridation of water. I am further opposed to the notion that a government body ought to determine how to treat a specific health issue among the masses based on a specific number of tooth decay cases. Whether that number is one or one million, there are those who don't want the treatment and have excellent dental health. This ought to remain in the hands of the individual. I do not want to be treated for something that I am not suffering from. Fredom to choose what care I want--isnt' that a basic charter right?

From: Colleen O'Neill
Sent: Tuesday, April 24, 2012 4:02 PM
To: Andrew Hill; Linda Murray; MAYOR EMAIL; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Wayne Gardy
Subject: Water Fluoridation

Dear Mayor Orsi and Members of Council

I am copying you, for your information, a letter I have sent to Dr. Satish Deshpande, MOE, who was referred to me by the Honourable Leona Agukklaq, Minister of Health, Canada.
Dr. Deshpande's letter to me raised several questions on the safety of HFSA used in water fluoridation.

All the best,

Colleen O'Neill

Attachment:

Satish Deshpande
Drinking Water Standards Section

Standards Development Branch
Ontario Ministry of the Environment
40 St. Clair Avenue West. 7th Floor
Toronto, Ontario M4V 1M2

Dr. Satish Deshpande:

Your letter to me, dated April 20, 2012, raises many questions.

You write: "***It should be noted that the chemicals that are used to fluoridate are so chosen because they rapidly dissolve in the water when used as directed***."

- * Why does the MOE permit the use of HFSA which is very toxic and easily taken up by the body?

You write: "***NSF International has considered the toxicological aspects of the fluoridation products as well as any detected contaminants and Standard 60 is designed to ensure that their levels are well below the levels where adverse health effects are likely. The toxicological reviews that NSF International uses to establish allowable contaminant levels in fluoridation chemicals are based on the work of noted agencies such as the United States Environmental Protection Agency."***

- * COMMENT: NSF neither has in its possession, nor is it seeking, any toxicological studies that demonstrate the safety of silicofluorides. NSF is not the only and final word on the dangers of co-contaminants of HFSA. In 1999, using NSF's own dilution information (0.43 ppb in drinking water at a dilution of 240,000 to 1) the National Academy of Science and the US National Resources Defense Council found that the typical concentration of carcinogenic arsenic commonly found in HFSA is likely to cause one cancer in 10,000. That result would certainly be classified as an 'adverse health effect'.

- * How do you explain the use of HFSA when there have been no toxicological assessments of silicofluorides commonly used in water fluoridation?

You write of "***the safety***" of the practice of water fluoridation.

- * How do you explain the fact that the USEPA admitted to Congress, in 2001, that it had no idea what the health effects of silicofluorides were when placed in municipal drinking water?
- * How can the MOE not be aware of these kinds of developments south of the border?
- * What does the MOE know that the USEPA does not?

You write: "***Products certified to NSF Standard 60 are of very high purity and unlikely to cause adverse effects when used as directed. Consequently, our Regulatory requirements prescribe that fluoridation chemicals must meet NSF Standard 60."***

* COMMENT: There are as many as 15 common co-contaminant in silicofluorides (NSF literature). NSF and the chemical plants do not remove any identified contaminants. Lead and arsenic are almost always in with silicofluorides.

* How can the MOE speak of 'very high purity' when these contaminants are being added to and forgiven in our water?

* If the MOE considers silicofluorides to be treatment chemicals, can the MOE describe how they accomplish pathogen removal, precursor reduction, turbidity clarification, TOC reduction, or any attributable role in the production of safe drinking water?

You refer to the “NSF Fact Sheet on Fluoridation Chemicals” which states that arsenic and lead are common contaminants of silicofluoride chemicals.

-
- * COMMENT: Lead is classified as a ‘probable human carcinogen’. Arsenic is classified as a certain ‘human carcinogen’. Both are added to the water with HFSA.
-
- * Would the MOE condone the addition of ***any*** carcinogen into drinking water, in ***any*** amount, even in high dilution?

* COMMENT: Health Canada’s ‘Arsenic in Drinking Water, 2006’ stated that every effort should be made to keep arsenic out of drinking water. Health Canada’s MAC for arsenic in drinking water is 10 ppb. MOE’s IMAC number is 25 ppb.

* Which number should be followed to remain compliant with the Safe Drinking Water Act? I await your reply.

Sincerely,

Colleen O’Neill

copied to: The Honourable Leona Agukklaq, Minister of Health, Canada
The Honourable Deborah Matthews, Minister of Health, Ontario

From: ALEC ADAMS
Sent: Tuesday, April 24, 2012 4:29 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Fluoride

To: Mayor Orsi and Council
While many public health officials and dentists favour the addition of fluoride to public water supplies, I have concluded that there are negative considerations that outweigh the alleged benefits. The evidence is that fluoride is a very toxic substance which can have particularly negative effects on infants and children as well as on people with kidney disease or compromised immune systems.

Bottle fed infants, whose food is made with fluoride treated water, ingest 100 - 150 times more fluoride than those who are breast fed. It seems that fluoride can damage their developing immune systems and, ironically, the cells of tooth pulp. According to the US Centre for Disease Control, 32% of children have some form of dental fluorosis, which is evidence of damaged tooth forming cells. It appears that there are many other potential fluoride health related issues which have not been adequately researched so surely, where there is doubt, we should adopt the precautionary principle.

In any event, the most effective way to prevent dental caries is through dental hygiene and the topical application of fluoride in toothpaste. Adding to a public water supply would be an incredibly imprecise method for administering even a universally acclaimed medication. It is also the case that many people drink only bottled water and many target populations drink pop instead of water and consume candy.

Given these considerations, I suggest that it would be unwise to add fluoride to the Orillia water supply. Instead, I believe that we should attempt education but also support the proposals of experts like Dr. Norm Campbell, whose views on salt consumption are expressed in the Life section of today's (Tuesday April 24) Globe and Mail. He states, "The purely voluntary approach has proven to be

completely ineffective. We need government oversight with targets and timelines, monitoring and evaluation to ensure sodium reduction in a fair, across-the-board manner." I believe that we need to take similar approaches with respect to the high levels of sugar and corn syrup, which are ubiquitous in soft drinks, candies and processed foods, and which contribute to tooth decay as well as to the more serious health problems, Type II diabetes, heart disease and cancer.

Alec Adams
Orillia, ON

Sent: Tuesday, April 24, 2012 6:32 PM
To: MAYOR EMAIL
Subject: Fluoridation

Please don't fluoridate our water. Our town has enough health problems without our "leaders" making decisions that will inevitably harm us all. What could possibly be your reasoning?

Shannon Jackson
Orillia

Sent: Thursday, April 26, 2012 9:22 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Michael Fogarty; pcxc@sympatico.ca; Andrew Hill; Tony Madden; Linda Murray
Subject: Flouride

As a person who takes control of her own health, I am totally against adding flouride to Orillia's water supply. It is not fair to force everyone to consume a drug that has been proven to have detrimental effects on many peoples health. A better solution would be to promote healthy eating and proper dental care. Even labels on toothpastes containing flouride carry a warning to not swallow the toothpaste. If you want my vote in the next election, please do not vote in favour of adding flouride to our water!

Maxine Freeland
Orillia, On.

Sent: Monday, April 30, 2012 2:21 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Water Fluoridation

Dear Councillors,

I am taking the time to write today to voice my concern about an important decision that needs to made about fluoridating Orillia's water supply. That decision needs to be ABSOLUTELY NOT!

I am not a taxpayer in the city of Orillia, but rather in Oro-Medonte, however my children attend high school in Orillia so this automatically makes it my concern as well as yours. Not to mention the fact that my entire family spends a lot of time in public areas in Orillia (including restaurants!) so this issue reaches far beyond the boundaries of Orillia and it's immediate residents.

As a dental hygienist, you may find it odd that I would be against water fluoridation, however I have seen more than my share of teeth with mottling, pitting and staining that occurs because of the ingestion of too much fluoride. When teeth are forming (prior to erupting in the mouth) and are exposed to too much fluoride these unsightly, irreversible marks occur and by then it is too late. And it is impossible to monitor. How do you gauge what kind of a dose of fluoride a person/child has had in a day? In this day and age when we are trying to battle a childhood obesity epidemic, and encourage them to drink more water instead of sugary drinks, this frightens me!!

I am not going to get into the ***adverse*** effects of fluoride, and that whole argument partly because I know you have heard it all, but mostly because I don't need to. The bottom line is that adding fluoride to a public water supply is **UNETHICAL** – plain and simple. Water is a basic necessity and we are very lucky in this country to have an abundant supply of it. Don't taint it with fluoride!

The solution to dental caries lies in **education** about proper dental hygiene and nutrition and promoting healthy foods in our schools and community. Fluoride IS beneficial in a topical form for many people, and available in toothpastes and more concentrated gels ***for those who need it!*** We do not add birth control to the water to control the teenage pregnancy rate! Why would we add fluoride? I know that there are many cities that do it, and have done it for years, but I would like to think that we have come a long way since some of the decisions that people and communities made in decades past. Just because it's been done in the past does not make it a logical or responsible choice today!

I urge you all to do the right thing and vote NO to fluoride in Orillia's water. Many people are counting on you to do the responsible thing.

Regards,
Lianne Lee

April 30th, 2012

Dear Mr. Orsi + City Councillors

I am writing you this letter because I am very concerned about the possibility that fluoride may be added to Orillia's drinking water. Please find attached 2 articles on the dangers of fluoride. I hope you are able to take the time to read them + agree that fluoride has no place in our water supply.

As stated in these 2 articles fluoride is very toxic + there is ample evidence that there is a strong link between fluoride + ;

- Dental Fluorosis (mottling of the teeth + the first sign of fluoride poisoning)
- Skeletal Fluorosis (osteoporosis + deformed bones)
- Premature Aging
- Cancer (especially a rare bone cancer)
- Attention Deficit Disorder (ADD)
- Birth Defects (Down's Syndrome)
- Autoimmune Disorders
- Kidney Damage

and the list goes on with many other health disorders + long term risks

Also in these articles are the following statements;

" The study showed fluoridation caused dental damage and held no benefit

"that fluoridated water is ineffective at reducing cavities."

"There is not one single study that shows that ingested fluoride reduces tooth decay"

I am a microbiologist + in 1993 - due to some health issues - I became very interested in natural healing. In 1996 I became a Registered Nutritional Consultant + I have come across many other articles + books about the harmful effects of fluoride.

With so many illnesses + diseases on the rise, beginning at younger + younger ages; it really scares me that fluoride is being considered to be added to our drinking water.
We are already bombarded with so many chemicals, preservatives, hormones + toxins in our food + in the environment. We certainly don't need another substance that will negatively affect our health.

As a child I had a white spot (dental fluorosis) on one of my teeth which was from fluoride treatments + using toothpaste with fluoride. I have not used fluoridated toothpaste in almost 20 years + I am now very healthy + have very healthy, strong teeth.

I also strongly believe that the citizens of Orillia should have the individual right to decide if they want to put fluoride in their bodies. I know I don't want to, + I'm sure many others wouldn't if they knew the facts. Fluoride is a toxic waste + it is even more toxic than lead.

I believe the time, effort + money would be far better spent on creating jobs + on education rather than putting fluoride in our water supply.

Please vote NO to the dumping of fluoride in our water supply. I am very concerned about the harm it could cause the people in Orillia - especially the children - as well as the damage fluoride can do to the environment.

Thank you for taking the time to read my letter + articles. I really do appreciate it.

Sincerely,

Susan Salvatore
(705) 326-2225

Fluoridation Update

by Richard G. Foulkes, MD

Stand on guard Canadians. The Health Protection Branch, hand-in-hand with US pro-fluoridation forces, is planning to increase the number of people whose bodies serve as receptacles for toxic waste!

The latest joint effort between Health Canada and the US Food and Nutrition Board (FNB) of the US National Institute of Health (NIH) and the National Academy of Science (NAS) is to produce a report entitled *Dietary Reference Intakes; Calcium, Phosphorous, Magnesium, Vitamin D and Fluoride.*

Animal experiments in the mid 1930s showed that fluoride is not required for normal growth and development. It was not until 1978 that the US Food and Drug Administration accepted that fluoride was not an essential nutrient. The US National Academy of Science took a similar position in 1989. In that FNB/NIH report, fluoride is referred to as a component of the diet that has "the ability to inhibit or even reverse the initiation and progression of dental caries (tooth decay) and has the unique ability to stimulate new bone formation."

As was the case in a Health Canada report published in 1994, no contemporary survey was found that could substantiate the claim of fluoride's ability to reduce tooth decay. Discredited data from studies carried out in the 1940s were used to determine an adequate intake level (AI). The AI is defined as a level that "reduces dental carries maximally in a population without causing unwanted side effects."

How can anyone prescribe an adequate intake of a dietary substance that cannot be shown to be effective to reduce tooth decay? In spite of this, adequate intake levels are presented but it is not possible to see these levels as "adequate" for anything other than poisoning the population.

Studies Show Harm

The FNB/NIH report contains contradictions, biased manipulations, errors and omissions of studies concerned with adverse effects. What are the effects that are being minimized by those not willing to properly inform the public of the risks associated with fluoride?

First there is dental fluorosis. This is a "mottling" of the teeth that may consist of obvious white patches or a brown discoloration. This is a visible sign of fluoride poisoning that occurs when developing teeth are exposed to fluoride. Dental fluorosis represents a defect in the enamel and a weakening of the tooth structure. It is on the increase in both fluoridated and non-fluoridated communities. This trend is related to the increase in total fluoride intake from foods and beverages prepared in fluoridated areas, fluoride dental products, fruit drinks and juices contaminated by fluoride-pesticides, and from airborne fluorides for those living in the neighborhood of fluoride-emitting industries.

Recent studies have shown that dental fluorosis may be associated with bone changes and low IQ. The finding by Chinese researchers that fluoride intake is associated with low IQ has been confirmed in the United States where animal studies showed neurological damage. Studies show a positive relationship between living in a fluoridated community and Down's Syndrome (Mongolism), cancer (especially a rare bone cancer) and increased fractures of the hip.

A serious consequence of ingesting fluoride over a period of years is skeletal fluorosis. In this disease, fluoride accumulation in bone and disturbance of calcium metabolism produces pain and stiffness of the back and joints that can progress to severe crippling and immobility. Calcium deposition in ligaments can

cause paralysis when this occurs in the spinal canal.

There is evidence of decreased birthrates in fluoridated areas. Animal studies prove that fluoride lowers sperm count. These adverse effects are supposed to be avoided by the establishment of tolerable upper intake levels. The FNB/NIH study states these are "set to protect the most sensitive individuals in the healthy general population."

This is nonsense! The upper intake level for infants is almost double the daily amount known to cause dental fluorosis. The upper intake levels for ages nine to 70 and over is sufficient to cause crippling skeletal fluorosis in 10 to 20 years!

Present Fluoride Intake

How much fluoride are we ingesting at the present time? The authors of the FNB/NIH report minimize the amount. The adult levels they present are about one-third of those to be found in a 1993 Health Canada study and a report published by the US Department of Health and Human Services in 1991.

It can be shown that these current daily intake levels, especially in fluoridated communities, are sufficient to make skeletal fluorosis a real possibility. Recognizable skeletal fluorosis (X-ray findings, back stiffness, arthritis of multiple joints, ligament, tendon calcification and weakened bones) could occur in the mid-30s and severe crippling disease by the early 80s. These signs and symptoms may be occurring now but are being misdiagnosed because physicians have been kept in the dark and do not think of these diagnoses.

Why the Push?

Fluoridation of 75 per cent of the US population by the year 2000 is American government policy and Canada is traveling the same road. Mandatory fluoridation bills have been passed by a number of states and Canadian provinces.

Many bureaucrats and academics, both in the United States and Canada, have based their careers (and funding) on this thrust to fluoride. The general public, including professionals, have been propagandized for more than 50 years about the benefits and safety of fluoridation and do not have the resources to investigate the claims.

Fluoridation provides a way in which industry, especially phosphate fertilizer manufacturers, can take a waste product (hydrofluosilicic acid) from the smoke stack scrubbers and dump it directly into community reservoirs, thereby circumventing the expensive process of hazardous waste disposal. At the same time, they are turning a profit.

Fluoridation has also served as a safeguard for manufacturers threatened by lawsuits over fluoride environmental calamities by giving this important pollutant a benign image. Recent declassified letters from the Manhattan Project (World War II atomic bomb) show that the spectre of lawsuits resulting from fluoride pollution, as a consequence of the massive amounts of fluoride required to prepare uranium isotopes for the atomic bomb, inspired the US military to take a "pre-emptive strike."

The military promoted the dental effects of fluoride and inaugurated an experimental trial in Newburg, New York to study the effects on the human body. Blood tests and tissue samples were gathered during the five years of the trial without the knowledge or the consent of the citizens involved! The secret findings have not been released.

The Heath Protection Branch is hand-in-hand with the United States whose National Fluoride Plan to Promote Oral Health establishes the objective to "send a clear and consistent message to the public that water fluoridation is safe and cost-effective."

Don't believe it! ■

Richard Foulkes lives in Abbotsford, British Columbia.

Recommended Reading:
It's All in Your Head
by H Huggins 207 pp (sc) $15.95
Toxic Metal Syndrome
H Richard Casdorph MD/Morton Walker MD 413 pp (sc) $21.50

Available at your local health food store or from ***alive*** **books** *PO Box 80055 Burnaby BC V5H 3X1. Please add $3.50 for p&h and 7% GST (plus 8% HST where applicable) when ordering from* ***alive*** **books**

by Michael Downey

Trouble on Tap

Toronto is Canada's fluoridation bastion, where the toxic element has been added to the public drinking water for 35 years and, for the most part, without substantial challenge—until now.

Studies published in journals such as the *Journal of the American Medical Association* show strong links between fluoridated water and dental fluorosis (pitted, brittle, easily-stained teeth, signified by white mottle-spots considered to be the first sign of fluoride poisoning); skeletal fluorosis (osteoporosis and deformed bones); cancer; behavioral and biochemical changes indicative of lowered intelligence and the symptoms of attention deficit disorder; premature aging; damage to collagen and DNA; birth defects; autoimmune disorders; and kidney damage.

Torontonians recently held a public forum at which the world's foremost fluoride authority, biochemist and author of *Fluoride: The Aging Factor,* Dr John Yiamouyiannis, made a presentation. Also speaking was Joel Paterson of Health Canada, who flew in from Ottawa, after a reversal of the government's initial refusal to attend.

Under questioning, Paterson appeared to have difficulty explaining the studies or justifying Health Canada's steadfast support for fluoridation in the face of extensive evidence of long-term risks. He admitted that the Health Canada studies were not original research but rather a review of the literature reporting past studies of others. Yet municipalities and dental associations across Canada repeatedly point to Health Canada studies as the source of the information on which they base their fluoridation decisions.

The question of individual rights arose twice. Asked one woman from the audience, "I choose how much refined carbohydrate I consume, so why don't I get to decide how much fluoride I get?"

Yiamouyiannis described the exhaustive research he conducted with the late Dr Dean Burk (developer of the MRI and former chief chemist of the US National Cancer Institute). The fluoride study—

by far, the largest in history—showed "that fluoridated water is ineffective at reducing cavities."

Dr Hardy Limeback, University of Toronto professor and Canada's top fluoride expert, agreed: "There is not one

single study that shows that ingested fluoride reduces tooth decay."

Public health officials and the Canadian Dental Association (CDA)—which is paid by manufacturers for its endorsement of fluoride toothpaste—often dismiss the hundreds of studies suggesting fluoridation is ineffective and dangerous to health as "flawed." Yiamouyiannis, referring to New Zealand research that examined the dental records of every child in the country, said, "How can you say it's flawed? It's not a sampling at all. It's the entire population!" (The study showed fluoridation caused dental damage and held no benefit.)

New Zealand's Dr. John Colquhoun wrote in 1982, "Common sense should tell us that if a poison circulating in a child's body can damage tooth-forming cells, then other harm is also likely."

Children are particularly susceptible to fluoride. Dental fluorosis is caused by excessive fluoride, taken in during the early years of life when the permanent teeth are forming beneath the gums. Growing bones may knit more fluoride into their fabric, resulting in later skeletal fluorosis. Danger to pets and small animals is possible; and one study suggests that falling BC salmon stocks are caused by the fluoride build-up in some of the province's waste water.

Fluoride is more toxic than lead; both can cause genetic alterations, neurological damage and bone pathology, says Yiamouyiannis.

"The safety level for lead is 10 parts per billion. Fluoride's safety level allows concentrations of one part per million—the equivalent of 1,000 parts per billion. What the heck are they thinking here?" And that's just from fluoridated water. We also ingest fluoride in foods, soft drinks, reconstituted juices and beer made in fluoridated areas, as well as accidentally-swallowed toothpaste. (Fluoride toothpaste holds as much as 1,500 parts per million or 1,500,000 parts per billion. The treatment applied in your dentist's office contains three times that concentration.)

Health Canada and the CDA say that fluoride is safe at "optimum levels. The trouble is, the only safe or optimum amount of fluoride is none at all," says Yiamouyiannis. ■

New Standards For Organic Farming

The government of Canada and the organic food industry have drafted 26 pages of recommendations for organic agriculture in Canada. These are expected to be formalized into a standard of certification. Proposed standards will ensure humane treatment of farm animals, food safety and optimum vitamin and mineral content in food. For example:

- Farm animals will be allowed to breed naturally.
- Chickens, pigs and other livestock will not be contained in cages but will run free.
- Sewage sludge, genetically manipulated plant breeding, synthetic pesticides and irradiation of foods will not be permitted.

Organic farmers will not be allowed to add growth-promoting antibiotics to animal feed or feed their animals slaughterhouse waste, dung and materials that have been fat-extracted with solvents. Farmers will also be required to have "buffer zones" around their farms to minimize the risk of crops being contaminated through the drift of pesticides sprays or genetically engineered seeds. Canadian growers of organic food have long been waiting for national standards of certification for their crops, but consumers are crying out for general standards of good farming to be applied to all crops and increase confidence in food safety. At present the public must buy organically grown food (which we recommend) or be at risk of food contamination from both plant and animals sources. Government "safety" measures, such as food irradiation and chlorination, are inadequate and irresponsible.

What is required is a return to good farm practices for all crop and livestock producers. This will improve food safety and quality, restore the land to mineral and microbial viability and establish a future for Canadian farmers. ■

—Rhody Lake

There is alot more information at www.fluoridealert.net & if you google 'Dangers of Fluoride' many very informative sites will come up.

A quote from the site 'Fluoridation: A Violation of Medical Ethics' is:

"Fluoridation is unethical because:

1.) It violates the individual's right to informed consent to medication
2.) The municipality cannot control the dose of the patient
3.) The municipality cannot track each individual's response
4.) It ignores the fact that some people are more vulnerable to fluoride's toxic effects than others. Some people will suffer while others benefit
5.) It violates the Nuremburg code for human experimentation.

I also googled the 'Benefits of Fluoride' + even Health Canada listed some of fluorides harmful effects (dental fluorosis, skeletal Flurosis) + warnings

I find it very difficult to understand why any city would consider putting anything in their water supply when there is a possibility of it causing harm to its citizens. Again, please Vote No to fluoride in our water.

Thanks again for your time, Susan

-----Original Message-----
Sent: Wednesday, May 02, 2012 8:51 AM
To: JASON COVEY
Subject: Fluoridation

Although I live in Ramara Township I purchase my water in Orillia. Please do not consider fluoridation. I grew up in a city that had it and my family still had cavities and I don't see that it had any benefit. Why add poison to our water?

Blessings,
Chris

From: Alan Malloch
Sent: Wednesday, May 02, 2012 2:04 PM
To: JASON COVEY
Subject: Re: Your response regarding Fluoridation issues

Dear Mr Covey

My thanks for your reply of April 18 to my email which I very much appreciate.

I look forward to hearing the findings regarding Fluoridation on 29 May and hope that will clarify the situation regarding the legality/illegality of the proposed system.

I do understand that you would not add lime to the water, but obviously there is a great deal of lime in the natural water supply. I really wondered if there was anything could be done to filter this before it reaches our homes.

I look forward to new Filter Media being introduced this year and do hope it will solve some householder issues.

Again, thank you for your prompt reply.

Irene Malloch

From: Marilyn and Steve Goulter
Sent: Wednesday, May 02, 2012 3:50 PM
To: JASON COVEY; MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Michael Fogarty; Wayne Gardy
Subject: Water Fluoridation - Inadvertent Over-dosing Concern - Evidence that it DOES occur!

Jason, Mayor Orsi and Councillors;

I have in the past expressed my concerns about the **inadvertent over-dosing of fluoride** - see attached e-mail below (from 27/03/12) discussing a "FAILURE MODES AND EFFECTS ANALYSIS" (FMEA). If something can go wrong, it probably will - its not "IF", but, rather "WHEN", how often and to what extent. More to the point, what are the potential consequences?
In doing this kind of analysis, if the consequences are potentially harmful or fatal, then mitigation action needs to be particularly significant in order to ensure that people don't get hurt by it.

I have recently come across evidence that this has happened in the USA on a REGULAR basis, justifying my concerns. The quote is as follows;

"Astonishingly, it has also been reported by the EPA that the **population are regularly exposed to extremely high concentrations of this toxin** due to repeated accidental releases **as a consequence of persistent operator errors** at water treatment facilities. The health or environmental implications of these incidences have never been examined or reported". (Ref; Human Toxicity,

Environmental Impact and Legal Implications of Water Fluoridation, by Declan Waugh, Environmental Management Services, Feb 2012, 343 pages of excellent material)

I come back to my original suggestion that the city of Orillia should conduct a very though FMEA, which of course would take into account **human factors** as well as all possible system errors/failures. Once completed, the mitigation action could well be - DO NOT FLUORIDATE THE WATER, as it just is not worth the RISK.

The citizens of Orillia will expect to see the full FMEA analysis.

Steve Goulter

Attachment:

Jason;
I request that this e-mail be entered into the public record for the fluoridation issue.

Thanks for the explanation. But this raises even more concern - how is the water/fluoride mix in the 1 inch line mixed in with the large flow in the much larger line? My knowledge of fluid flow and mixing rates would give me concern that these two fluid streams may not be 100% mixed by the time the sampler is reached unless you use an impeller or mixing device of some sort. How do you make sure that the fluoride is completely mixed at the point where the fluoride sensor is placed? If it is not, the sensor could be missing a sample that contains the fluoride, resulting in the system feeding in way too much fluoride, resulting in the people of Orillia drinking much higher amounts of fluoride than anyone ever intended.

I spent some considerable time today talking to the people at METCON.
I first spoke to one of their Engineers. He also helped me to understand how the system would work in a typical installation. We talked at length about the details, dual pumps and how to perform maintenance without shutting down the system, and in particular, the details of the monitoring device, fluoride sampler, sensors, etc. It sounds like they purchase many of these components and design the system around existing components. As for the exact details of the internal workings, he was not that clear. I tried to have a detailed discussion about component failures and the resulting consequences, but he was not able to engage on this level. I asked him over and over again, phrasing my questions in many different ways, about details of a Safety Analysis and after a long discussion, he stated that, to his knowledge, based on over ten years of working on these systems, he had never been asked these questions before and that he was not able to provide such an analysis. He felt no one else in the Co. would be doing this, if it was not in his Dept.

I then asked to be transferred to the Sales Dept. - spoke to Brabal Ray. He also had very little knowledge of the Safety Analysis concept and felt that this would not be farmed out to a third party to his knowledge.

Jason, this really worries me - ie these systems are not NEARLY AS SAFE as they should be, in light of the fact that we are "playing with potential harm to humans".

You have stated that some form of Risk Analysis and Risk Analysis Outcomes are mandated under ODWQM Standards and will be done for inclusion in your Operational Plan. I would be interested in knowing how an appropriate analysis could be even possible without detailed knowledge of the internal workings of the vendor supplied components? In addition, this type of analysis is always done by a specialist in the field - an Engineer trained in this area to question the consequences of a failure in every wire, connector, electronic component, sensor, relay, valve, pump, etc to identify dormant failures that may not even be evident by monitoring staff. When the details are understood and the result of a failure is deemed to be unacceptable, a warning system, periodic check, or some other action is taken or put in place to mitigate against this eventuallity.

If this type of Safety Analysis is to be performed by your staff, could you please ask the types of questions outlined above so that the citizens of Orillia CANNOT BE HARMED BY THIS SYSTEM. I am dumbfounded to think that anyone looking at the "BIG PICTURE" would feel that the very small advantage (suspect at best) is worth this kind of risk!

I also point out that, starting Jan 1, 2013, individuals within the Municipality will become PERSONALLY liable for any actual or perceived damages caused to any individual citizen. I am told that there is usually a wave of law suites from a few disgruntled citizens anyway, every time a system like this is introduced!

Like I said to you the last time we met - I would not want to be in your shoes - a very tough position to be in!

Jason, if the town goes ahead with water fluoridation, please can you ensure that there is a requirement in the RFP documents that will result in proper Safety Analysis being done by the designer of the system you purchase so that we can all feel better about this. There may be other suppliers out there that could do a much better job of this than METCON. Just a thought.

Steve Goulter

From: BRUCE MILLER
Sent: Friday, May 04, 2012 2:49 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: The Fluoride Issue

Mayor Orsi and Members of Council,

The giant and very powerful fertilizer industry wants to add Orillia to their list of municipalities willing to take their toxic waste and relieve them of their moral responsibility to deal with it in a proper and responsible manner. By law, they cannot dispose of it in and body of water, yet if you approve the addition of fluoride in Orillia's municipal water, you are willing to pass it through the bodies of your citizens and ultimately place it the beautiful treasure we have in the lakes Orillia is blessed with. Moreover, there is a Federal initiative to clean up Lake Simcoe, so by adding untreated fluoride to the lake via your WWTP's is absolutely contrary to that undertaking.

Why commit to the capital investment of the necessary receiving, storage and injection system and related equipment to deliver to your target at the rate about 2% of total water treated? Why also would you continue to spend the operating costs associated with purchasing the silicofluoride, arsenic, lead, mercury and radionuclides - the toxic waste of the fertilizer industry? 98% of potable water produced is not ingested and therefore misses your target - it goes to multiple other domestic, commercial and industrial uses. Virtually all of it will however reach our pristine lakes through various channels of discharge.

I have an alternative for you - spend the same amount (if not less) on a program of educating the educators at every level. Promote dental hygiene, nutrition and healthy food programs in the education program which can be delivered through multiple channels. Ultimately get the message out to 100% of your target with no waste and no pollution. Have Orillia join the enlightened municipalities such as The City of Calgary, The City of Waterloo, and over 90% of the municipalities in BC and Quebec - they have studied this issue and have made an informed moral and conscious decision to either stop fluoridating their water, or refusing to fluoridate at all.

While not a resident of the city of Orillia, we and our family and friends are there daily enjoying the offerings of your diverse retailers, food and beverage servers, and many others that would have a need to use and/or serve Orillia's municipal water. We have told some of them that if fluoride is introduced into Orillia's water, they will unfortunately no longer enjoy our business. Further, we enjoy the use of Lakes Simcoe and Couchiching as boaters, paddlers and swimmers. Our private well draws from the aquifer associated with Lake Simcoe, as we live on the shore of this magnificent lake. Consequently we would be very exposed to the toxic waste that you would distribute on behalf of the fertilizer industry.

In conclusion, on Monday, May 7th, we urge you to VOTE NO to the fluoridation of Orillia's municipal water. Other councils before you had the correct insight and responsible character

to vote no to this issue. Force the fertilizer industry to deal with their toxic waste in a moral and responsible manner!!

Thank you,

Bruce and Virginia Miller
Ramara Township

From: hans schmitz
Sent: Friday, May 04, 2012 4:11 PM
To: MAYOR EMAIL
Subject: fluoride

my name hans Schmitz, orillia
our drinking water is bad enough don"t make it worst
no fluoride in our drinking water
thank you

From: Susan Salvatore
Sent: Sunday, May 06, 2012 12:23 PM
To: MAYOR EMAIL; thegardys@hotmail.com; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: FW:

Dear Mr. Orsi and City Councillors,

Soon after I left you the information on fluoride, my daugther forwarded me a website she received from a friend (24 years old). I was very impressed to see how open and educated the younger generation is.

I am forwarding this websitel about fluoride to you. It is very informative. I hope you can take the time to read it since adding fluoride to our water can affect so many people.

Thank you again for your time on this very important issue.

Sincerly,

Susan Salvatore

http://www.consciouswater.ca/fluoride-in-water/

From: Carolyn Beers
Sent: Monday, May 07, 2012 11:03 AM
To: MAYOR EMAIL
Subject: water

As a senior with a few health issues I would ask that there be no fluoride added to the water in Orillia. As a mother of 4, and a foster parent of over 100 children from 1966-1989 the amount of water ingested by these kids would have make no difference in their dental health.The fluids of choice were milk and lots of fruit juice either fresh or canned, but never reconstituted frozen.

Perhaps the question of putting fluoride in our water should be put on the ballot at the next election.

CJ Beers
Orillia On

City of Orillia

ORILLIA CITY CENTRE
50 Andrew Street S.
Suite 300
Orillia, ON L3V 7T5

TELEPHONE
(705) 325-1311
FACSIMILE
(705) 325-5178

OFFICE OF THE CITY CLERK

Direct Line: (705) 325-2108
E-MAIL: jnyhof@orillia.ca

May 7, 2012

RECEIVED
MAY 0 8 2012
PUBLIC WORKS
ENGINEERING

Mr. Mike Whelan
337 West St. N, # 45
Orillia, ON L3V 5E1

Re: Fluoridation in the City's water

Mr. Whelan:

This to acknowledge receipt of your e-mail received by the Mayor's Office on May 7, 2012 regarding fluoridation.

Please be advised that the deadline for public input was March 30, 2012, as noted on the City's website, and that any correspondence received after that date will not be placed on a Council agenda. I have, however, forwarded your correspondence to the Public Works Department for their information.

Please refer to the City of Orillia's website at http://www.orillia.ca/en/livinginorillia/Fluoridation.asp for further updates on this matter.

Regards,

Janet A. Nyhof

Janet A. Nyhof, CMO
Deputy Clerk

:dc

Copy to: Jason Covey, Water/Wastewater Engineer, Public Works Department

H:\COUNSERV\TOMRMS DIRECTORY\C - Council, Boards and By-laws\C00 - Council, Boards and By-laws\C00 Council\Correspondence\2012\April 2 - C\Late Fluoridation letters\Cnst 28 -Mike Whelan - Fluoridation.doc File: E05-FLU

Mayor + Members of Council:

TO WHOM IT MAY CONCERN

I AM A RESIDENT OF ORILLIA AND NOT IN FAVOR OF FLUORIDE IN MY WATER

YOURS RESPECTFULLY

Mike Whelan
337 West St. N.
#45
Orillia, ON L3V 5E1

----- Original Message -----
From: Susan Schweitzer
To: mayor@orillia.ca ; Patrick F. Kehoe ; thegardys@hotmail.com ; petebowen12@gmail.com ; linda.murray170@gmail.com ; mfogarty@bell.blackberry.net ; pcvc@sympatico.ca ; andrew.hill@bell.net ; tonymadden@rogers.com
Sent: Tuesday, May 08, 2012 1:39 AM
Subject: Susan Schweitzer - Orillia Citizens Against Fluoridation - Late Breaking News

Dear Mayor Orsi and Orillia City Councillors,
I wanted to thank you, again, for allowing us to make our deputation, detailing the risks involved in water fluoridation.
I got some news, when I arrived home, after the Orillia council meeting. It was given to me by the group in Hamilton that would be the equivalent to Orillia Citizens Against Fluoridation: At their May 7, 2012 council meeting, a motion was **passed** that was very much the equivalent of the Peel Region motion. I have attached it.
At the forum of Feb. 29th, I made a comment, during the comments section of the evening, which I subsequently forwarded to you. It was the Peel Region motion regarding water fluoridation. Of all of the things I have seen regarding water fluoridation, this is one that simply seemed to be in the best interests of all of the residents of any community, no matter on what side of the issue you 'hang your hat'.
Of course, my fondest hope is that you have decided that water fluoridation is just too risky for your residents, period, without this interim step, if only because these motions have the need to be brought forward at all.
Thank you, for your consideration. Susan Schweitzer
Orillia Citizens Against Fluoridation

From: Susan Schweitzer
Sent: Tuesday, May 08, 2012 1:40 AM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Susan Schweitzer - Orillia Citizens Against Fluoridation - Late Breaking News

Dear Mayor Orsi and Orillia City Councillors,
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Thank you, for your consideration. Susan Schweitzer
Orillia Citizens Against Fluoridation

Attachment:

CITY OF HAMILTON
MOTION

Date: Monday April 16, 2012

MOVED BY COUNCILLOR B. McHATTIE………….

SECONDED BY COUNCILLOR ……..

Water Fluoridation: New Data and Recent Developments BOH08024(c) (City Wide)

a) That Health Canada be requested to regulate the fluorosilicate hexafluorosilicic acid (H2SiF6) and sodium Silicofluoride (Na2SiF6), used as a treatment for dental cavities in

drinking water, either as i) a drug under the Food and Drug Act, or as ii) an additive and/or supplement through the Bureau of Chemical Safety;

b) That all chemicals, especially fluorosilicates, added to drinking water for the purpose of treating dental decay undergo i) new drug applications and be assigned drug numbers by Health Canada; and/or ii) assessment by the Bureau of Chemical Safety for inclusion in the Food Additive Dictionary

c) That classification of fluorosilicates as a drugs and/or additives/ supplements shall be based on at least one long term toxicology study to determine health effects in humans;

d) That at least one properly conducted, appropriately controlled trial be used to provide effectiveness as the basis for a new drug classification, and/or inclusion in the Food Additive Dictionary;

e) That staff contact Dr. Satish Deshpande, Team Leader, Water Standards Section, Ontario Ministry of the Environment, to request a copy of the NSF Standard 60 required toxicology studies of the product used for fluoridation in Hamilton, to ensure its safety at the maximum use level, including effects from any potential contaminants in the product;

f) That the City of Hamilton make the above recommendations to Health Canada, to reassure the citizens of Hamilton that the use of fluorosilicates added *to* drinking water for the purpose of treating dental decay is safe and what the health effects are;

g) That Health Canada support municipalities on this issue by undertaking peer reviewed studies on municipal jurisdictions who have recently removed fluoride from drinking water.

h) That a copy of this resolution be sent to the Federal and Provincial Minister of Health, and Hamilton area MPs and MPPs;

i) That Hamilton area MPs and MPPs be requested to follow up on this issue with the Minister of Health and report back to the Hamilton Board of Health with a response.

Attachement:

BRAMPTON GUARDIAN

By Peter Criscione
January 12, 2012

Peel Region's fluoride debate hasn't been fully flushed despite a decision last April to keep the substance in the municipality's drinking water. Councillors passed a motion today urging Health Canada to classify fluoride for drinking water as a drug, and that the substance, used to prevent tooth decay, be assigned a "drug number" which, like over-the-counter medication, lets users know the product is subject to stringent government regulations.
Politicians made the move following a lengthy Debate and after hearing from several residents opposed to water fluoridation.
"We should not be afraid to ask questions and to challenge Health Canada (about fluoridation)," said Mississauga Councillor Pat Mullin.
"If there is even one doubt then we should be looking into this." In April, Council voted to continue with fluoridation, but asked staff to look into the possibility of reducing the amount in drinking water from 0.7 mg/L (milligrams per litre) to 0.2 mg/L, or the minimum amount recommended by the province and federal government.

That report, presented by Peel Medical Officer of Health Dr. David Mowatt today, recommends that the Region stick with current fluoride levels because they are optimal in preventing tooth decay.

In compiling the report, staff largely drew on comprehensive reviews Health Canada did between 2007 and 2010 (the last review was published in 1996), which reaffirmed the agency's guideline of 0.7 mg/L fluoride concentration in the drinking water supply.

Fluoride. Councillors passed a motion Thursday urging Health Canada to classify fluoride for drinking water as a drug

"Given the extensive review and the current recommendation of 0.7 mg/L, lowering fluoride in drinking water to 0.2 mg/L would not be effective in decreasing tooth decay," the report to Council states.

However, the roughly 30 people who showed up at Council on Thursday shot down the recommendation to council and insisted politicians to do their own homework on the issue.

Politicians heard from six delegates who urged Council to reconsider its position on fluoridation.

One by one, speakers drew on reports, studies and personal anecdotes to argue there is much evidence to suggest that fluoridation is bad for your health.

They asked politicians to provide residents with proof that fluoride is safe, that levels in the water supply are regulated and that the substance poses no real adverse health risk to people.

"We are asking you, our elected representatives, to do your due diligence, to provide us with the evidence," said Mississauga resident Leisa Cianchino. "All we are asking is for proof (that fluoridation is safe)."

Stopping short of revisiting the April 2011 vote on fluoridation in Peel, which would require a two-thirds majority vote to do, politicians opted to take the issue to a higher level.

The motion passed Thursday calls on Ottawa to regulate fluoride used as a treatment for dental cavities in drinking water as a drug under Natural Health Product Regulations.

It also insists that all chemicals added to drinking water for the purpose of treating dental decay undergo new drug applications and be assigned a drug number by Health Canada.

Councillors essentially agreed with delegates that although it is dispensed as a drug in the water, fluoride isn't approved as one.

A drug number pen'nits a manufacturer to market products in Canada and serves as a tool to help in the follow-up of products on the market, recall of products, inspections, and quality monitoring.

Thursday's motion also states that the classification of fluoride as a drug be based on at least one long-term toxicology study to determine health impacts on humans.

Sent: Tuesday, May 08, 2012 9:57 AM
To: MAYOR EMAIL
Subject: drinking water fluoridation

Mayor Orsi:

I am emailing you to inform you that I DO NOT give my informed consent to add fluoride to our drinking water. I am well aware of the harms it can cause. I urge you and the other city councillors to reconsider this move. There are better ways of spending our money. There is a provincial program in place called 'Children in need of dental treatment' or CINOT for short. Please spend our money urging low income families to use this service rather than fluoridating our drinking water. It is harmful, carries little benefit to prevent dental caries and is difficult to monitor the amount consumed by each resident. I urge you to do more non-partisant research on the fluoridation of drinking water. Would you want you children ingesting this harmful substance?

Sincerely,
Linsey O'Donnell

----- Original Message -----
From: Susan Schweitzer
To: mayor@orillia.ca ; Patrick F. Kehoe ; thegardys@hotmail.com ; petebowen12@gmail.com ; linda.murray170@gmail.com ; mfogarty@bell.blackberry.net ; pcvc@sympatico.ca ; andrew.hill@bell.net ; tonymadden@rogers.com
Sent: Tuesday, May 08, 2012 12:35 PM
Subject: Re: Susan Schweitzer - Orillia Citizens Against Fluoridation - Late Breaking News

Further clarification, specifically this motion was passed unanimously by Hamilton Board of Health, now expected to be passed by Hamilton Council (all same mayor and council members as the Board of Health Committee). Thank you all, for your interest. Susan Schweitzer

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From: Susan Schweitzer
Sent: Tuesday, May 08, 2012 2:02 PM
To: Patrick Kehoe; Tony Madden; Andrew Hill; Paul Spears; Michael Fogarty; Linda Murray; Pete Bowen; thegardys@hotmail.com; MAYOR EMAIL
Subject: Susan Schweitzer - Orillia Citizens Against Fluoridation - Hamilton News Update

Today's newspaper article, on this subject, from Hamilton Community News:
http://www.hamiltonnews.com/news/hamilton-wants-fluoride-classified-as-a-drug/

From: Kyle Johnson
Sent: Tuesday, May 08, 2012 4:51 PM
To: MAYOR EMAIL
Subject: No fluoride!

Recent studies have shown the negative long-term effects of water fluoridation. I for one do not want it in my drinking water. Please, keep our community healthy and DO NOT poison our drinking water.

-Concerned Orillia citizen.

Sent: Tuesday, May 08, 2012 10:05 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com
Subject: Please DON'T Start an Artificial Water Fluoridation Program in Orillia
Importance: High

Dear Mayor and City Councillors:

There are many reasons why water fluoridation should not be started and these are just some. I urge you to spend a few minutes to understand the severe long term health implications caused by fluoride.

Ingesting fluoride it is not effective in preventing tooth decay and is harmful to human health and the environment. According to Health Canada, fluoride is not a nutrient. It is being added to our municipal water supplies as a medication – giving more authority to municipal authorities than we give to doctors, as they are not allowed to medicate patients without their consent. The ingestion of fluoride in municipal water has been linked to lower IQs and dental fluorosis in children; increase in hypothyroid disease, especially in women; and an increase in hip fractures in the elderly. Some studies have also linked it to skeletal fluorosis and osteoscarcoma or bone cancer. I understand that there are differing opinions about the effect of ingesting fluoride on human health, however, I believe when scientific opinions vary, it is best to err on the side of caution. Evoking the precautionary principle in the case of fluoridating municipal water carries no risk as the widespread use of fluoridated toothpastes and the availability of dental care to our population will serve as effective preventatives to tooth decay. More than 3,200 doctors, dentists, scientists and environmentalists have recently signed a declaration calling for the end to fluoridating municipal water. If you have not had the opportunity already, please have a look at the video at http://www.waterloowatch.com/fan%20video.html where some of these scientists, including a Nobel Laureate in Medicine, provide leading arguments against the fluoridation of municipal water.

Recently, The Canadian Association of Physicians for the Environment has called for an end to municipal water fluoridation as has the respected coalition Great Lakes United. Health Canada's website clearly states "The fluoridation of drinking water supplies is a decision that is made by each municipality . . . This decision may also be taken in consultation with residents." Health Canada also gives clear guidelines about not using fluoridated toothpaste on children under three years old and advise on using fluoride carefully at all ages to "minimize risk". *Ref: http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/fluor-eng.php

(See sections *Considerations for Children* *and* *Provincial and Municipal Governments Role*).*

I am not comforted by the fact the Health Canada currently "has established the guideline for fluoride in drinking water as a maximum acceptable concentration of 1.5 milligrams per litre. Water containing fluoride at, or below, this maximum acceptable concentration does not pose a risk to human health," because Health Canada has previously regarded many chemicals, in many uses as safe before eventually finding they weren't, including pesticides, flame retardants, bisphenol A and many others too numerous to mention. Below, I have included some quick facts for you to consider.

Key points to consider:

Limited Use

- Most countries in the world, including most European countries do not add fluoride to their municipal water.
- Countries like Germany and Finland that ended fluoridation have found no subsequent increase in cavities.
- Studies have shown that overall reduction in cavities is directly linked to fluoride toothpastes, good dental care, a nutritious diet, and in countries where dental care is not provided as a government service, by higher income level. It is not related to whether the water is fluoridated.

2007 Caledon-Brampton Study

- A comparison was made between 7-year-old children of Caledon, with unfluoridated water, and the children of Brampton, with fluoridated water. Over 1,000 children in 25 schools were surveyed for the incidence of dental cavities. The study concluded that "The effect of fluoridation on caries in these communities was not evident" Caledon [Not Fluoridated] - Brampton [Fluoridated] Study: D. ITO, 2007 Determinants of caries in adjacent fluoridated and non-fluoridated cities.

Factors that did affect the incidence of dental cavities were:

- dental hygiene
- nutrition
- use of dental sealants
- breast feeding vs infant formulas
- country of birth

The IADR/AADR/CADR 85th General Session and Exhibition (March 21-24, 2007). Ref: http://iadr.confex.com/iadr/2007orleans/techprogramforcd/A93552.htm

- According to Health Canada, only 43% of Canadians have water that is fluoridated by their municipality. The rate of dental caries is not statistically different between Canadians in comparable fluoridated and non-fluoridated areas, for instance, between cities in the Niagara Region that don't fluoridate and cities in Peel Region that do.
- Health Canada no longer considers fluoride an essential nutrient and states that fluoride requirements should "only be based on the beneficial effect on dental caries". Ref: http://www.hc-sc.gc.ca/ewh-semt/consult/ 2009/fluoride-fluorure/draft-ebauche-eng.php (see *9.1.1 Essentiality*)

Danger To Infants

- *Fluoride is readily transferred from mother to fetus across the placenta (IPCS, 2002). Ref. http://www.inchem.org/documents/ehc/ehc/ehc227.htm (See* 1.5 Kinetics and metabolism in humans and laboratory animals*).*
- In November 2006, the US Public Health Service's Centers for Disease Control and Prevention, and the American Dental Association (ADA), released a recommendation that infant formula NOT be made with fluoridated water. The ADA states: "If liquid or powdered concentrate infant formula is the primary source of nutrition, mix with water that is fluoride free, including water that is labelled purified, demineralised, deionised, distilled or reverse osmosis filtered water." This was because of concerns over the effects of fluoride on developing infants, especially in terms of developing dental fluorosis, a condition that disfigures and weakens teeth that is caused by the ingestion of fluoride.

Danger To Children

- Dental fluorosis is prevalent in our community, as it is in many parts of North America, and is caused by the ingestion of too much fluoride by babies and young children when the enamel of the tooth is forming.

- One cannot assume that a medication that causes this visible damage to the tooth is not causing other unseen damage to related material (bone) in the body.

Medicating Without Consent

- A medication should never be administered without individual consent, to a broad population whose medical history is unknown or at a dose that cannot be controlled. The City and Region, currently has no idea how much water any one individual drinks and how it may interact with other medications or health factors. Please note that our most vulnerable citizens – our infants – are often being fed formula made exclusively with our fluoridated tap water.

Toxic By-Product

- Unlike the fluoride added to toothpaste, the fluoride added to our drinking water is not medical grade. In fact, it is a toxic by-product of the phosphate fertilizer industry and contains impurities including arsenic and lead.

Negative Health Impacts

- Studies have linked fluoride to various diseases in humans including hypothyroidism and cancer (osteosarcoma). Health Canada notes, "In view of the small difference between the estimated daily intake of inorganic fluorides and the level at which adverse effects on the skeleton are anticipated, it is recommended that exposure of the population of Canada to inorganic fluorides continue to be closely monitored." Ref: http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl1-lsp1/fluorides_inorg_fluorures/fluorides_inorg_fluorures_4-eng.php
- The fluoride we are exposed to in our municipal water is only one source for fluoride. We ingest additional fluoride from pesticides, dental products, some drugs and some foods.
- Most recent study published in PubMed January 2012. New research reveals a startling new finding: fluoride is likely contributing to the epidemic of cardiovascular disease by stimulating calcification of the vascular system, including the coronary arteries. http://www.ncbi.nlm.nih.gov/pubmed/21946616

Danger To Environment

- Health Canada also says: "On the basis of available information, inorganic fluorides are entering the Canadian environment from anthropogenic (human) sources in quantities resulting in concentrations in some Canadian waters, plants, and air, that may cause long-term harmful effects to biota in aquatic and terrestrial ecosystems. It has been concluded that inorganic fluorides have the potential to cause harm to the environment. Ref: http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl1-lsp1/fluorides_inorg_fluorures/fluorides_inorg_fluorures_3-eng.php - Under 3.0Assessment of "Toxic" under CEPA 3.1 CEPA 11(a) Environment)
- The impacts of Fluoride on our environment and species, our Biodiversity, is a cause for concern. Fluoride bio-accumulates in the environment having the most severe consequences on the species at the top of the food chain. For instance, in the aquatic environment, effects in salmon range from delayed egg hatching to death. Studies have shown that levels of fluoride above .05 milligrams per litre (mg/l) are dangerous to these species. Ref: http://www.scribd.com/doc/29386809/Camargo-JA-2003-Fluoride-toxicity-to-aquatic-organisms-a-review-Chemosphere-50-3-251-64-PMID-12656244
- Current Canadian Water Quality Guidelines for fluoride in water to protect human health is 1.5 mg/l. The CWQG guideline to protect aquatic species is 0.12 mg/l. In comparing the guideline for human health to health for aquatic species is clearly out of line if we are to protect biodiversity. If you look at the research for certain aquatic species, as noted above, the CWQG for aquatic species is not protecting aquatic life. Even at CWQG for human health, a question that needs to be asked is given the bioaccumulation of fluoride is there really a safe level? Furthermore, if we use the CWQG for human health, the regard for other species and our environment is disregarded. Any reductions to man related increases in fluoride in our environment should be a priority to enable a more sustainable future for all.

Canadian Association of Physicians for the Environment Statement Against Fluoridation

- The Canadian Association of Physicians for the Environment (CAPE) statement reads in part: "The Canadian Association of Physicians for the Environment does not support fluoridation of drinking water . . . on the basis of the "weight of evidence" we believe that fluoridation of drinking water is scientifically untenable, and should not be part of a public health initiative or program." For the complete statement go to: http://www.cape.ca/res_cardfile.shtml?cmd[227]=i-227-e29cb89dc0610f57e31e5f550b936ed4&cmd[252]=i-252-e29cb89dc0610f57e31e5f550b936ed4

Great Lakes United Statement Against Fluoridation

- Great Lakes United's Statement says in part: "Whereas the Basel Convention, Environment Canada and the United States Environmental Protection Agency (US EPA) all state that the chemicals used in artificial water fluoridation are hazardous waste which may not be put directly into lakes, river and oceans; whereas artificial fluoridation chemicals contain between 20 to 30% hydrofluorosilicic acid (inorganic fluoride), trace amounts of arsenic, lead, mercury, radionuclides and other heavy metals, all considered to be toxic substances under the comprehensive Environmental Response, Compensation and Liability Act Priority List of Hazardous Substances in the USA, 1989 First Priority Substances List in Canada and proposed for "virtual elimination" under the Canadian Environmental Protection Act, the 1997 Binational Toxic Strategy and the 1978 Great Lakes water Quality Agreement . . . Therefore be it resolved that Great Lakes United works to reverse existing government policies supporting artificial drinking water fluoridation . . ." For the full statement go to: http://www.glu.org/en/node/337

Short BUT Powerful Video Clips

- Fluoride Dangers ~ They Knew All Along ~ (1950's Rare Archive) -- **http://naturalnews.tv/v.asp?v=8D1299CC3E46CB378C44D0E39AC6AB7A**
- FLUORIDE: WHAT Is It & WHY It's In Our water -- **http://naturalnews.tv/v.asp?v=7FC9A6050DC13A2B6606084CED94863C**
- FLUORIDE: Cancer, Science & Politics -- **http://naturalnews.tv/v.asp?v=1ED029B58F837DFE774F8C4CC63E474C&autostart=false**
- **Confirmed - Cancer Deaths Liked to Water Fluoridation - Dr. Dean Burk -- http://www.youtube.com/watch?v=qg_oQoTdnYc**

In closing, less than 1% of fluoridated municipal water is actually ingested. For every $1000. of fluoride chemical added to water, $995. would be directly wasted down the drain in toilets, showers, dishwashers, laundry, car wash, etc., $5 would be consumed in water by the people, and less than $0.50 (fifty cents) would be consumed by children, the target group. ***Can you think of a more wasteful government program?***

Thank you for listening and please keep this industrial waste out of our water supply.

Sincerely,

Diane DiFlorio.

Date: 9 May 2012 15:21:18 -0400
Subject: Fluoridate Orillia's Water
To: linda.murray170@gmail.com

Dear Councillor Murray,

I have been reading the alarmists' views of the dangers of fluoridation with concern. Their shrill unscientific opinions are reminiscent of the Great Cranberry Scare of 1959. The Centre for Disease Control and Prevention states, "For 65 years, community water fluoridation has been a safe and healthy way to effectively prevent tooth

decay. CDC has recognized water fluoridation as one of 10 great public health achievements of the 20th century."

www.cdc.gov/fluoridation/index.htm

The alarmists' arguments are baseless. While it is true that toothpaste containing fluoride can be acutely toxic if swallowed in large amounts, the risk of using the amount of fluoride toothpaste on a toothbrush is low enough that the use of full-strength toothpaste
(1350-1500 ppm fluoride) is considered safe for all ages. Compare this to the minuscule 15 ppm of fluoride contained in fluoridated water.

My wife and her mother grew up without fluoridation in their water supply. Her mother had all of her teeth extracted at age 16; my wife has had a lifetime of dental problems, root canals, fillings, extractions and partial plates. Our two children, on the other hand, grew up drinking fluoridated water in Richmond Hill. Now in their thirties, neither on has ever had a cavity and they have no idea about the ordeal and expense of poor dental health. Our young granddaughter now lives in Orillia, where I trust she, too, will enjoy the benefits of fluoridated water.

I trust that reason will overcome the shrillness. Prevent the children of Orillia from being condemned to a lifetime of dental misery. For their sake, fluoridate Orillia's water.

Craig Welbourn
Washago, ON

-----Original Message-----
From: Duncan Walker
Sent: Wednesday, May 09, 2012 10:25 AM
To: MAYOR EMAIL
Subject: Don't fluoridate my water!!!!!

I plan on launching a law suit against the city of Orillia if you poison our water with fluoridation.

From: Ivy J
Sent: Thursday, May 10, 2012 10:42 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Please Don't Fluoridate Our Water

To Whom it May Concern,
I have been born and raised here in Orillia and feel that it is appropriate for me to, therefore, voice my opinions on any current events.
As for further fluoridating our water, I do not feel it is necessary. So many people are already filtering their water and have access to a dentist; so I don't see the need to add something more to our water.
I feel that as long as we have clean water, that is enough; we shouldn't be adding things to it that may actually be a potential risk, as not everyone may respond to it as well as anticipated. Many actually have reactions to things like fluoride.
It is our own responsibility to look after our teeth and I believe there are other things that should be closely looked at, that are more important, in comparison to simple dental problems.
Please do not fluoridate our water.
Thank you.
- I.J.

Sent: Thursday, May 10, 2012 11:15 AM
To: Dr. Peter Cooney
Subject: Debate on Water Fluoridation
Importance: High

1102 Kitchen SR
RR1 Coldwater ON L0K 1E0

May 10, 2012

Open Letter to Dr. Peter Cooney
Chief Dental Officer
Health Canada

Dr. Cooney:

Re: Water Fluoridation Debate
On February 29, this year, you came to Orillia to promote Water Fluoridation at the Public Forum sponsored by the city and the Health Unit. During your presentation you made several statements which need clarification and verification. There was not an opportunity on February 29th to question you or discuss your statements.

After your presentation, you told me that you would be willing to debate the water fluoridation issue. As you know, I have emailed you several times, beginning March 2, 2012, to arrange this debate.

When you wrote that you were unable to give two days to travel to Orillia for a debate, we gave you the opportunity of choosing, at your convenience, a date and time when the debate could be held in Ottawa. To date, you have not indicated when you will debate water fluoridation.

On May 7th you wrote "you could invite whomever you wished. The individual you eventually select is your decision, not mine, but I wish you well in your deliberations."

But it is you, Peter, that we want. We feel that if you have the time to come to Orillia to present the case case for fluoridation, you should also be prepared to present your case in a debate before citizens and experts. Citizens, after all, pay your salary. Needless to say, we would quite understand if you were to make a decision, as a civil servant, that you don't want to meddle in this controversial issue at all. However, since you have clearly chosen one side - which means that you must have enormous confidence in the matter, we believe that you should feel quite capable of defending your position against the strongest of fluoridation's critics - with the caveat that the meeting be administered and chaired in a completely neutral manner.

As far as timing is concerned we appreciate that you have been tied up in March, April and May - but surely you must be able to find some time in June, July, August or even into the fall. Just give us the day and we will do our best to make this happen in Ottawa. Just think of us as another council that wants your advice - we just happen to be a council of citizens and taxpayers.

I am puzzled why it is that civil servants, who exude so much confidence in solo presentations, do not have the courage of their convictions when challenged to debate the matter with experts who have studied the issue in great depth, e.g. Dr. Paul Connett, Dr. James Beck.
Peter, I am looking forward to your participation in this debate.

Sincerely,

Colleen O'Neill

copied to: Media
Interested Parties

From: L Morley
Sent: Thursday, May 10, 2012 2:29 PM
To: MAYOR EMAIL
Cc: thegardys@hotmail.com; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: recreation facility site selection

Mayor Orsi & Councillors,

Having resided in Orillia for over forty years I can not remember being so disheartened and disillusioned with my municipal politicians. I used to be a proud ambassador of my city. That feeling has passed on. The ongoing issue of the recreation facility site selection by this council leaves me completely gobsmacked. When I read media reporting councillors using terms such as blackmail; decorum, respect and courteous productive debate seems to be missing.
My personal opinion is this has become political grandstanding.
You need to park the egos at the door, sit down and reach a concensus on what will be best for future generations. We have one chance to get this right and it will need to be an inclusionary process. At present, the cart is before the horse. Site selection needs to be a starting point followed by components and design. The current structure of pillars bring to mind silos which stand alone and are not inclusionary. I would like to think that all user groups, age groups and agencies have had a personal contact in one to one not large group formats. You are at liberty through democracy to express your opinions on the site. It is important, however,that your views are not based on premises,conjectures and unsubstantiated assertions that are injurious to any site.

I listen to the flouride debate, 174 West, 225 West with great interest. Simply put, I am amazed at the "Red Herrings", "The Sky Is Falling" opinions being expressed by the self annointed experts. The most bothersome are those who are not even a part of our city.
You were elected with our trust please don't breach that trust. Only you as a team can make a decision that will be respected by the majority, many from whom you will not hear.

I picked this up from an Ontario Hydro publication many years ago:

Walk far from cynics and whiners,
they don't believe,they never have.
Uphold those who care,who share.
Cheer on those willing to change,
cheer on the renewers,cheer on the new.

Let's get the job done. Look at our beautiful new library so deserving of a great community celebration showing what can be accomplished.
Build on the positive synergy of the library to bring home an beautiful new recreation facility for Orillia.

respectfully
Larry Morley

From: Rick Beyers
Sent: Monday, May 14, 2012 9:13 AM
To: MAYOR EMAIL; Patrick Kehoe
Subject: Politics of fluoride -a nuanced view

I am a retired dentist and resident of ward one. At 70 years of age I can provide a nuanced view of this annoying political issue. Many years ago I was the lead to sustain fluoride in Waterloo – early 1980's.
I have great sympathy for the members of the community who fear communal water fluoridation as a result of the energy imparted by the concerned citizens.
If you are interested in my perspective, I am willing to provide it – else I will be a quiet observer of this energy draining conflagration.
Regards,
Rick Beyers

From: Marilyn and Steve Goulter
Sent: Tuesday, May 15, 2012 4:23 PM
To: JASON COVEY; MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony

Madden; Michael Fogarty; Wayne Gardy; Charles Gardner
Subject: Water Fluoridation - the Precautionary Principle

I attach definitions and discussions of the **Precautionary Principle.**

I believe this material is relevant to the "water fluoridation" issue.

Please note this quote in particular from Dr. Cooney:

"At the extreme, such a requirement could involve bans and prohibitions on entire classes of potentially threatening activities or substances" (Cooney, 2005).

…… like water fluoridation, fluorosilicates and Hexafluorosilicic Acid!

Please vote "NO" to Water Fluoridation.

Thank You considering my input.

Steve Goulter

Attchment:

Precautionary principle

From Wikipedia

The **precautionary principle** or precautionary approach states that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is *not* harmful falls on those taking the action.

This principle allows policy makers to make discretionary decisions in situations where there is the possibility of harm from taking a particular course or making a certain decision when extensive scientific knowledge on the matter is lacking. The principle implies that there is a social responsibility to protect the public *(or the Environment)* from exposure to harm, when scientific investigation has found a plausible risk. These protections **can be relaxed only if further scientific findings emerge** that provide sound evidence that no harm will result.
In some legal systems, as in the law of the European Union, the application of the precautionary principle has been made a statutory requirement.[1]

Formulations of the precautionary principle

Many definitions of the precautionary principle exist. Precaution may be defined as "*caution in advance*," "*caution practised in the context of uncertainty*," or *informed prudence*. All definitions have two key elements.

1. an expression of a **need by decision-makers to anticipate harm before it occurs.** Within this element lies an implicit reversal of the onus of proof: under the precautionary principle it is the responsibility of an activity proponent to establish that the proposed activity will not (or is very unlikely to) result in significant harm.
2. the establishment of an obligation, if the level of harm may be high, for action to prevent or minimise such harm even when the absence of scientific certainty makes it difficult to predict the likelihood of harm occurring, or the level of harm should it occur. The need for control measures increases with both the level of possible harm and the degree of uncertainty.

One of the primary foundations of the precautionary principle, and globally accepted definitions, results from the work of the Rio Conference, or "Earth Summit" in 1992. Principle #15 of the Rio Declaration notes:

"In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[2]

This definition is important for several reasons. First, it explains the idea that scientific uncertainty should not preclude preventative measures to protect the environment. Second, the use of "cost-effective" measures indicates that costs can be considered. This is different from a "no-regrets" approach, which ignores the costs of preventative action.

The 1998 Wingspread Statement on the Precautionary Principle summarizes the principle this way: **"When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically."**
(The Wingspread Conference on the Precautionary Principle was convened by the Science and Environmental Health Network [3]).

The February 2, 2000 European Commission Communication on the Precautionary Principle notes: "The precautionary principle applies where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the high level of protection chosen by the EU".

The January 29, 2000 Cartagena Protocol on Biosafety says: "Lack of scientific certainty due to insufficient relevant scientific information . . . shall not prevent the Party of import, in order to

avoid or minimize such potential adverse effects, from taking a decision, as appropriate, with regard to the import of the living modified organism in question."

It is important to emphasize that, although this principle operates in the context of scientific uncertainty, it is considered by its proponents to be applicable only when, on the basis of the best scientific advice available, there is good reason to believe that harmful effects might occur.

The precautionary principle is most often applied in the context of the impact of human actions on the environment and human health, *or both* as both involve complex systems where the consequences of actions may be unpredictable.

As applied to environmental policy, the precautionary principle stipulates that for practices such as the release of radiation or **toxins** or massive deforestation the burden of proof lies with the advocates. [1] Concerning potential risks to public health, examples of cases in which the precautionary principle has been advocated (but not always accepted) are: the commercialization of genetically modified foods, the use of growth hormones in cattle raising, measures to prevent the "mad cow" disease, health claims linked to phthalates in PVC toys, among many others.

An important element of the precautionary principle is that its **most meaningful applications pertain to those that are potentially irreversible**, for example **where biodiversity may be reduced**. With respect to bans on substances like mercury in thermometers, freon in refrigeration, or even carbon dioxide exhaust from automobile engines and power plants, it implies:

... a willingness to take action in advance of scientific proof [or] evidence of the need for the proposed action on the grounds that further delay **will prove ultimately most costly to society and nature, and, in the longer term, selfish and unfair to future generations.**

The concept includes an implicit ethical responsibility towards maintaining the integrity of natural systems, and acknowledges the fallibility of human understanding.

Strong versions justify or require precautionary measures and some also establish liability for environmental harm, which is effectively a strong form of "polluter pays". For example, the Earth Charter states: "When knowledge is limited apply a precautionary approach …. Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm." Reversal of proof requires those proposing an activity to prove that the product, process or technology is sufficiently "safe" before approval is granted. Requiring proof of "no environmental harm" before any action proceeds implies the public is not prepared to accept any environmental risk, no matter what economic or social benefits may arise (Peterson, 2006). At the extreme, such a requirement could involve bans and prohibitions on entire classes of potentially threatening activities or substances (Cooney, 2005).

…… like water fluoridation!

From: Sarah Faery
Sent: Thursday, May 17, 2012 8:19 AM
To: MAYOR EMAIL
Subject: Fluoride

Hello there,

I would just like to say that I am against putting Fluoride in the water. I would rather see more education on dental hygiene and nutrition.

Thank you

Sarah Leber
Orillia ON

Sent: Thursday, May 17, 2012 12:49 PM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors,

Vote against fluoridating Orillia's water supply.

Thank you!

Elizabeth Abrantes
Cambridge, Canada

Sent: Thursday, May 17, 2012 3:15 PM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,

Vote against fluoridating Orillia's water supply.

Thank you!

Keep fluoride out of peoples bodies and out of our waterways.

Krista Gallagher
Toronto, Canada

Sent: Thursday, May 17, 2012 4:39 PM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,

Vote against fluoridating Orillia's water supply.

Thank you!

Shira Biner
Kingston, Canada

Sent: Thursday, May 17, 2012 5:07 PM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,

Vote against fluoridating Orillia's water supply.

Thank you!

Craig Murray
Windsor, Canada

From: Colleen O'Neill
Sent: Sunday, May 20, 2012 5:20 PM
To: MAYOR EMAIL
Subject: "Staff to recommend fluoride"

Dear Angelo,
I was quite taken aback when I read in Orillia Today on May 17, 2012, that "City staff is poised to recommend fluoridation of Orillia's water in a report co-authored by the public health unit."

Angelo, as you probably are aware, many people, in good faith, submitted excellent fact-based scientific information for the Public Record on water fluoridation.

Why is the health unit co-authoring staff's report? The facts are being filtered through the health unit, which promotes the addition of hydrofluorosilicic acid to the water?
The process is obviously flawed.
I question whether Council will have the information it needs to make this serious decision, if it depends on information to be delivered through the staff report. Will members of Council read submissions to the Public Record since submissions on water fluoridation are not received for Council Agenda.

There is a wealth of information pointing in the direction of keeping HFSA out of the water. To date, I have not had my questions about health risks answered by the The Honourable Leona Aglukkaq, Minister of Health, Dr. Charles Gardner, MOH, Dr. Satish Deshpande, Water Standards Development Branch, Ontario Ministry of the Environment.

Thank you, Angelo, for addressing this matter.

Sincerely,

Colleen O'Neill

-----Original Message-----
From: Lil Payne
Sent: Monday, May 21, 2012 6:34 AM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Liquid life

Good morning Sir/Madame

Just a brief but pregnant statement concerning the consideration before you respecting our water supply. Can this not be looked upon as a win win situation?
There is strong and valid reasoning for standing guard over this precious, life sustaining necessity, water.
For those who feel strongly for fluoridation there is no one standing in the way for private treatment of their personal water supply. Before I was aware of it's dangers, I used to add fluoride drops to our water. That is an option open to those who support it's use.
To introduce fluoride to the water supply as a whole imposes upon those who see it's dangers the unhappy situation of no escape.
Since private fluoridation is an option, please consider offering the same freedom of choice to those who are opposed to it's introduction to our water supply.
Respectfully yours,
Lil Payne

From: Wayne Kirby
Sent: Monday, May 21, 2012 10:01 PM
To: MAYOR EMAIL; thegardys@hotmail.com; Patrick Kehoe; Pete Bowen; lindamurray170@gmail.com; Michael Fogarty; andrewhill@bell.net; Tony Madden; jcovey@orillia.com; Paul Spears
Subject: Fluoridation of our water supply

subject -Orillia water fluoridation- please carefully weigh the pros and cons before making a decision

We do not want to have flouride added to the city water. I currently run the tap water thru a Britta filter and can still detect chemicals in the water if left standing overnight. I have started boiling the water to get rid of the chemical taste. The last thing we need here in Orillia is more chemical contamination of our wate.

With thanks,
Wayne Kirby

Attachment:

May 22, 2012

To: Mayor and Council
City of Orillia
From: Wayne Kirby and Family
Subject: Fluoridation
CC: Peter Dance-Director of Public Works
Jason Covey – Water- Waste Water Engineer

To: Mayor and Council, please accept this letter of concern and comments in regards to the Fluoridation of the City of Orillia water system.

As a citizen of Orillia and an operator in the municipal water industry, my family and I are greatly concerned that the City of Orillia is considering Fluoridation of the public water system.
First of all, I believe we should have the right to decide if we want to be medicated or not to maintain our oral health. A physician can prescribe medication, but he/she cannot force you to take if you don't wish to. Why are their warnings on tooth paste containers not to swallow it? We believe that the health unit is simply trying to put the costs of oral health on the City's tab.

Dr. Gardner and the Simcoe Muskoka District Health Units facts and figures do not truly represent Orillia. The math used to calculate the figures are generally inflated figures typically used by Provincial and Federal governments to make statistics look good or bad to sway public opinion in their favour. There are many different underlying issues that affect tooth decay, starting with personal hygiene, diet, income, lifestyle, etc. all affect things differently.

Orillia is also surrounded by several townships whose citizens use Orillia's dental facilities i.e. Oro Medonte, Severn township, Rama....This also contributes to the facts and figures. These people from outside City of Orillia will not be exposed to the same degree as someone who lives in town and eats, drinks and bathes in city water on a daily basis.

Of great concern is an article in the " Orillia Today" May 17/2012 By Frank Maty's, stating staff are poised to propose fluoride use. The City's water wastewater engineer nor any other senior staff members involved in this project have visited the water filtration plant to communicate with plant staff about our views or opinions on this very important topic.

As a worker in the municipal water industry, Fluoride is known to be a very hazardous chemical to work with.
In closing, please consider why some municipalities are fighting to **remove** Fluoridation and some larger municipalities have already **discontinued** the process of putting Fluoride in their municipal drinking water system.

I would encourage you to promote other alternative methods of oral health and hygiene and NOT FLUORIDATE THE MUNICIPAL WATER SUPPLY.

Yours truly,
Wayne Kirby and Family

From: Melanie Baldaia
Sent: Tuesday, May 22, 2012 2:47 AM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,

Vote against fluoridating Orillia's water supply.

Thank you!

Melanie Baldaia
Providence, Rhode Island

Sent: Tuesday, May 22, 2012 2:47 AM
To: MAYOR EMAIL
Subject: Clean and Safe Water, Fluoride Free!!!

Dear Mayor Orsi and Orillia City Councilors, ,

Vote against fluoridating Orillia's water supply.

Thank you!

Melanie Baldaia
Providence, Rhode Island

Sent: Tuesday, May 22, 2012 10:29 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: FW: Association of vascular fluoride uptake with vascular calcif... : Nuclear Medicine Communications

To Mayor Orsi and Orillia Councillors,

Forwarding - Nuclear Medicine Communications has recently (2012) published the correlation between Fluoride uptake and calcification in major arteries.

http://journals.lww.com/nuclearmedicinecomm/Abstract/2012/01000/Association_of_vascular_fluoride_uptake_with.3.aspx

Sincerely,

Ruth Bednar

Sent: Tuesday, May 22, 2012 12:09 PM
To: Andrew Hill ; Angelo Orsi; Linda Murray; Michael Fogarty; Patrick Kehoe ; Paul Spears; Pete Bowen; Tony Madden; Wayne Gardy (waynegardy@hotmail.com)
Subject: Fluoridation

NO FLUORIDE IN THE WATER – Please.

Jennifer Cooling
Orillia, ON

From: Curtis Smith
Sent: Wednesday, May 23, 2012 5:57 AM
To: MAYOR EMAIL
Subject: ABOUT PUTTING F INTO CANADIAN WATER

GREETINGS MAYOR OF ORILLIA,

IT HAS COME TO MY ATTENTION THAT SOME PEOPLE PLAN TO LACE THE DRINKING WATER OF ORILLIA WITH FLUORIDE....

MAY I SUGGEST THAT YOU VOTE AGAINST THIS FOR SEVERAL REASON, INCLUDING . . .

1) This denies a freedom of choice of the user and resident. . .

2) The drug F remains in the body after use.... (yeah just a little I know) but it accumulates with every drink we take, it goes into the Kool-Aid, the coffee and tea
and even into the homebrew and wine we make for the cottage. When I make homebrew, I want to know I have real beer sans some slime in it.

3) The drug F is for local administration i.e.: teeth and not for every organ of the body.... by adding F to water, well it's like using a scorched earth policy of slaughtering thousands to get a single culprit....
Yeah, by getting at the teeth, you are also hitting every cell and organ in the body, the heart, brain, liver and so forth.
Would it not be better to a) have public schools be on the alert for students with excess cavities b) provide individualized counseling and intensive monitoring of flossing and brushing with follow-ups
c) provide problem students with hi tech sonic tooth brushes.

Please note that I grew up in Newmarket, Ontario... a place with fluoridated water, but still had many issues with my teeth when I was young. Had I had the above mentioned help, well maybe things would be different.

But, please, lay off the F for Orillia.

Regards,

Curtis Smith
Taipei, Taiwan

From: Raymond Ray
Sent: Wednesday, May 23, 2012 12:07 AM
To: thegardys@hotmail.com; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; MAYOR EMAIL
Subject: fluoride

Your worship Mayor and the Members of the Council.

City of Orillia
Ontario

Dated: 22/5/ 2012

Subject: Fluoridation

I am writing this letter as a concerned citizen and scientist expressing my concern in regards to the fluoridation of our drinking water. I am urging all of you to read the attached article so that you will know more about fluoridation. You will read how it started in the Second World War, how the Nazi Germans used it on the prisoners in the Concentration Camps and how it started in America, in a gruesome manner, during the Cold War.

Many cities and towns in Canada adding industrial hazardous waste hydrofluorosilicic acid to its water supply for many years. Unfortunately our city councilors are misguided by Canadian health organizations.

You will be told to believe that adding industrial toxic waste fluoride and heavy metals in our water will improve dental health. You will be told due to the dilution of Fluoride in the water it cannot herm.

Please remember you are elected and you are responsible to the citizen of you town and city for their wellbeing. You are to protect municipal democracy from being hijacked by some so called health officers those are telling you that fluoride prevents tooth decay when none of that has scientific evidence or any research was conducted in Canada.

The worst lie of all is telling us that we carefully considered all the evidence and came to the conclusion that Fluoride do not harm or causes any health hazard..

It is a fact, that Ontario Safe Drinking Water Act regulates fluoride as a contaminant and forbids the addition of arsenic, lead, aluminum, cadmium and radioactive uranium - contaminants that are found in hydrofluorosilicic acid. But we are informed that our fluoridated water, with increased contaminants, meets all provincial regulations for quality. Is it true or a big lie?

It is impossible to control fluoride intake therefore most of the time we are poisoning ourselves by taking higher volumes of fluoride through drinking water, bathing, food and many other sources. Unfortunately this has never been adequately addressed by Health Canada and the Public Health Agency of Canada. The prevalence and costs to society for dental harm, neurotoxic damage, cardiovascular disease, arthritic-like symptoms, bone fractures, Alzheimer's disease, premature births, and renal disease due to fluoride overexposure is difficult to calculate, but recent estimates completed in the USA suggest that the health costs due to water fluoridation exceeds one trillion dollars. Our health system is one of the best in the world. It may come one day when you will need it most it will not be there for you.

We are told that Health Canada sets the fluoride level based on ample proof of safety but that’s not true in law or science. Environment Canada regulates the fluoridation chemical as a

horrible pollutant that is not supposed to get into water or air or food supply. So how is it that one Governmental department say it is good and the other says it is dangerous?

The addition of fluoridated products into our drinking water does not satisfy the regulatory requirements of various laws including the Food and Drug Act, Ontario Clean Water Act and many other associated regulations and Acts. Adding Fluoride in to the drinking water municipality braking the law.

The toxic producers make massive profit by selling thousands and thousands of tons of this dangerous byproduct per year for water fluoridation instead of having to dispose of it as toxic waste at great expense, which also allows them to avoid enormous tort liability as well. We know very well 99% of this fluoridated water is used for lawn watering, car washing, doing laundry, washing dishes, taking baths, flushing toilets and so on. At the end those toxic chemicals end up in our water sources, our lakes and rivers. Ask yourself is it for really to protect our teeth or?

There are many towns here in Ontario such as Kingston, Guelph, Waterloo, Kitchener, Cambridge, Port Hope, Town of St. Mary, city of Niagara Falls etc. do not add fluoride to their drinking water. Is it because they know more than we do or they care for their citizens more than we do.

I want to mention to all councilors that Ontario Fluoridation Act gives YOU as an elected member of council, not the provincial health dept. or the Board of Health, the legal authority to stop fluoridation no matter what you are told. But also you must know that Health Canada in order to protect itself from the legal responsibility clearly said (Petition #299, Answer #3, to Auditor General of Canada) that “Health Canada does not regulate; hexafluorosilicic acid (H_2SiF_6) or sodium silicofluoride (Na_2SiF_6); the actual products used in water fluoridation there for determining the safety of such products or any other fluoride additive into drinking water is the full responsibility of municipalities. That tells us that the councillors are responsible for illegally medicating public without having medical degree or licence to practice medicine.

The supreme court of Canada states that fluoridation is used for a “special health purpose.” Municipalities do not have the authority to pass a by-law to add a chemical substance to a town or city’s water supply for medicinal purposes unless they have medical degree and license to practice medicine.

In 1957 the Supreme Court of Canada ruled that fluoridation was a "compulsory preventive medication", which is “not to promote the ordinary use of water as a physical requisite for the body” but has a “special health purpose”.

A legal action between Campbell v. Kingsville 4 D.L.R 772. Pg. 772 of the ruling: "A municipality which negligently fails to take adequate precautions to ensure the purity of its water supply will be liable in damages to a taxpayer who sustains loss by reason of the death of a member of his family from drinking same."

In a legal action between Schloendroff v. The Society of the New York Hospital 211 N.Y. 125 at 129. Judge Cardozo heard the Schoendroff case and ruled: "Every adult human being is in sound mind has right to determine what shall be done with his own body."
Supreme Court Justice Cartwright stated: "In pith and substance the by-law relates not to the provision of a water supply but to the compulsory preventative medication of the inhabitants of the area. In my opinion, the words of the statutory provisions on which the appellant relies do not confer upon the council the power to make by-laws in relation to matters of this sort."

Supreme Court Justice Rand stated: "But it is not to promote the ordinary use of water as a physical requisite for the body that fluoridation is proposed. That process has a distinct and different purpose; it is not a means to an end of wholesome water for water’s function but to an end of a special health purpose for which water supply is made use of as a means."

If you do not believe me, please inspect your children for signs of fluoride poisoning. If you read the attached article you will be able to understand and recognize changes in your child's health. No matter whose children they are, each child has the right to live healthy and happy. No one should be allowed to take it away from them for someone's personal gain.

The children are very precious and they are the gift of God. No matter what anyone says, they do not deserve to be hart. I am urging you please consider when you vote. It is the time to acknowledge that we have a duty to protect our children so that they can grow healthy and start their life. Please do not make their little body dumping ground of toxic chemical when already they are consuming enough dangerous Fluoride through other sources.
Thank you for your time.

Yours truly.
Dr. Raymond Ray . D.Sc
Canada, New York, Los Angeles

Att #1:

TEXT OF THE BASEL CONVENTION AND DECISIONS OF THE CONFERENCE OF THE PARTIES (COP 1 TO 5)

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INTRODUCTION

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted by the Conference of Plenipotentiaries in Basel in 1989, was developed under the auspices of the United Nations Environment Programme. The Convention entered into force in 1992. As of September 2000, 135 countries and the European Community were Parties to the Convention.

This publication contains the text of the Basel Convention as well as the decisions adopted by the Conference of the Parties at their first (1992), second (1994), third (1995), fourth (1998) and fifth (1999) meetings. The ban amendment adopted by the third meeting of the Conference of Parties is referred to in the text in two places; first as part of the Decisions III/1 (Amendment to the Basel Convention) and as a supportive explanation to the Annex VII to the Convention. The Amendment will enter into force when it has been ratified by three fourths of the Parties present at the time of the adoption of the Amendment (62 Parties). The fourth meeting of the Conference of the Parties adopted Annexes VIII and IX which became an integral part of the Convention. These annexes entered into force on 6 November 1998 together with the amended Annex I. The fifth meeting of the Conference of the Parties was held in Basel, Switzerland from 6-10 December 1999 celebrating the tenth anniversary of the adoption of the Convention. The Conference adopted a Protocol on Liability and Compensation for Damage resulting from Transboundary Movements of Hazardous Wastes and their Disposal which is not yet in force. The Conference also adopted the Basel Declaration on environmentally sound management of hazardous wastes.

Mr. Per Bakken
Officer-in-Charge
Secretariat of the Basel Convention
September 2000

TEXT OF THE BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

ADOPTED BY THE CONFERENCE OF THE PLENIPOTENTIARIES

ON 22 MARCH 1989

PREAMBLE

The Parties to this Convention,

Aware of the risk of damage to human health and the environment caused by hazardous wastes and other wastes and the transboundary movement thereof,

Mindful of the growing threat to human health and the environment posed by the increased generation and complexity, and transboundary movement of hazardous wastes and other wastes,

Mindful also that the most effective way of protecting human health and the environment from the dangers posed by such wastes is the reduction of their generation to a minimum in terms of quantity and/or hazard potential,

Convinced that States should take necessary measures to ensure that the management of hazardous wastes and other wastes including their transboundary movement and disposal is consistent with the protection of human health and the environment whatever the place of disposal,

Noting that States should ensure that the generator should carry out duties with regards to the transport and disposal of hazardous wastes and other wastes in a manner that is consistent with the protection of the environment, whatever the place of disposal,

Fully recognizing that any State has the sovereign right to ban the entry or disposal of foreign hazardous wastes and other wastes in its territory,

Recognizing also the increasing desire for the prohibition of transboundary movements of hazardous wastes and their disposal in other States, especially developing countries,

Convinced that hazardous wastes and other wastes should, as far as is compatible with environmentally sound and efficient management, be disposed of in the State where they were generated,

Aware also that transboundary movements of such wastes from the State of their generation to any other State should be permitted only when conducted under conditions which do not endanger human health and the environment, and under conditions in conformity with the provisions of this Convention,

Considering that enhanced control of transboundary movement of hazardous wastes and other wastes will act as an incentive for their environmentally sound management and for the reduction of the volume of such transboundary movement,

Convinced that States should take measures for the proper exchange of information on and control of the transboundary movement of hazardous wastes and other wastes from and to those States,

Noting that a number of international and regional agreements have addressed the issue of protection and preservation of the environment with regard to the transit of dangerous goods,

Taking into account the Declaration of the United Nations Conference on the Human Environment (Stockholm, 1972), the Cairo Guidelines and Principles for the Environmentally Sound Management of Hazardous Wastes adopted by the Governing Council of the United Nations Environment Programme (UNEP) by decision 14/30 of 17 June 1987, the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (formulated in 1957 and updated biennially), relevant recommendations, declarations, instruments and regulations adopted within the United Nations system and the work and studies done within other international and regional organizations,

Mindful of the spirit, principles, aims and functions of the World Charter for Nature adopted by the General Assembly of the United Nations at its thirty-seventh session (1982) as the rule of ethics in respect of the protection of the human environment and the conservation of natural resources,

Affirming that States are responsible for the fulfilment of their international obligations concerning the protection of human health and protection and preservation of the environment, and are liable in accordance with international law,

Recognizing that in the case of a material breach of the provisions of this Convention or any protocol thereto the relevant international law of treaties shall apply,

Aware of the need to continue the development and implementation of environmentally sound low-waste technologies, recycling options, good house-keeping and management systems with a view to reducing to a minimum the generation of hazardous wastes and other wastes,

Aware also of the growing international concern about the need for stringent control of transboundary movement of hazardous wastes and other wastes, and of the need as far as possible to reduce such movement to a minimum,

Concerned about the problem of illegal transboundary traffic in hazardous wastes and other wastes,

Taking into account also the limited capabilities of the developing countries to manage hazardous wastes and other wastes,

Recognizing the need to promote the transfer of technology for the sound management of hazardous wastes and other wastes produced locally, particularly to the developing countries in accordance with the spirit of the Cairo Guidelines and decision 14/16 of the Governing Council of UNEP on Promotion of the transfer of environmental protection technology,

Recognizing also that hazardous wastes and other wastes should be transported in accordance with relevant international conventions and recommendations,

Convinced also that the transboundary movement of hazardous wastes and other wastes should be permitted only when the transport and the ultimate disposal of such wastes is environmentally sound, and

Determined to protect, by strict control, human health and the environment against the adverse effects which may result from the generation and management of hazardous wastes and other wastes,

HAVE AGREED AS FOLLOWS:

Article 1

Scope of the Convention

1. The following wastes that are subject to transboundary movement shall be "hazardous wastes" for the purposes of this Convention:

(a) Wastes that belong to any category contained in Annex I, unless they do not possess any of the characteristics contained in Annex III; and

(b) Wastes that are not covered under paragraph (a) but are defined as, or are considered to be, hazardous wastes by the domestic legislation of the Party of export, import or transit.

2. Wastes that belong to any category contained in Annex II that are subject to transboundary

movement shall be "other wastes" for the purposes of this Convention.

3. Wastes which, as a result of being radioactive, are subject to other international control systems, including international instruments, applying specifically to radioactive materials, are excluded from the scope of this Convention.

4. Wastes which derive from the normal operations of a ship, the discharge of which is covered by another international instrument, are excluded from the scope of this Convention.

Article 2

Definitions

For the purposes of this Convention:

1. "Wastes" are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law;

2. "Management" means the collection, transport and disposal of hazardous wastes or other wastes, including after-care of disposal sites;

3. "Transboundary movement" means any movement of hazardous wastes or other wastes from an area under the national jurisdiction of one State to or through an area under the national jurisdiction of another State or to or through an area not under the national jurisdiction of any State, provided at least two States are involved in the movement;

4. "Disposal" means any operation specified in Annex IV to this Convention;

5. "Approved site or facility" means a site or facility for the disposal of hazardous wastes or other wastes which is authorized or permitted to operate for this purpose by a relevant authority of the State where the site or facility is located;

6. "Competent authority" means one governmental authority designated by a Party to be responsible, within such geographical areas as the Party may think fit, for receiving the notification of a transboundary movement of hazardous wastes or other wastes, and any information related to it, and for responding to such a notification, as provided in Article 6;

7. "Focal point" means the entity of a Party referred to in Article 5 responsible for receiving and submitting information as provided for in Articles 13 and 16;

8. "Environmentally sound management of hazardous wastes or other wastes" means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes;

9. "Area under the national jurisdiction of a State" means any land, marine area or air space within which a State exercises administrative and regulatory responsibility in accordance with international law in regard to the protection of human health or the environment;

10. "State of export" means a Party from which a transboundary movement of hazardous wastes or other wastes is planned to be initiated or is initiated;

11. "State of import" means a Party to which a transboundary movement of hazardous wastes or other wastes is planned or takes place for the purpose of disposal therein or for the purpose of loading prior to disposal in an area not under the national jurisdiction of any State;

12. "State of transit" means any State, other than the State of export or import, through which a movement of hazardous wastes or other wastes is planned or takes place;

13. "States concerned" means Parties which are States of export or import, or transit States, whether or not Parties;

14. "Person" means any natural or legal person;

15. "Exporter" means any person under the jurisdiction of the State of export who arranges for hazardous wastes or other wastes to be exported;

16. "Importer" means any person under the jurisdiction of the State of import who arranges for hazardous wastes or other wastes to be imported;

17. "Carrier" means any person who carries out the transport of hazardous wastes or other wastes;

18. "Generator" means any person whose activity produces hazardous wastes or other wastes or, if that person is not known, the person who is in possession and/or control of those wastes;

19. "Disposer" means any person to whom hazardous wastes or other wastes are shipped and who carries out the disposal of such wastes;

20. "Political and/or economic integration organization" means an organization constituted by sovereign States to which its member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve, formally confirm or accede to it;

21. "Illegal traffic" means any transboundary movement of hazardous wastes or other wastes as specified in Article 9.

Article 3

National Definitions of Hazardous Wastes

1. Each Party shall, within six months of becoming a Party to this Convention, inform the Secretariat of the Convention of the wastes, other than those listed in Annexes I and II, considered or defined as hazardous under its national legislation and of any requirements concerning transboundary movement procedures applicable to such wastes.

2. Each Party shall subsequently inform the Secretariat of any significant changes to the information it has provided pursuant to paragraph 1.

3. The Secretariat shall forthwith inform all Parties of the information it has received pursuant to paragraphs 1 and 2.

4. Parties shall be responsible for making the information transmitted to them by the Secretariat under paragraph 3 available to their exporters.

Article 4

General Obligations

1. (a) Parties exercising their right to prohibit the import of hazardous wastes or other wastes

for disposal shall inform the other Parties of their decision pursuant to Article 13.

(b) Parties shall prohibit or shall not permit the export of hazardous wastes and other wastes to the Parties which have prohibited the import of such wastes, when notified pursuant to subparagraph (a) above.

(c) Parties shall prohibit or shall not permit the export of hazardous wastes and other wastes if the State of import does not consent in writing to the specific import, in the case where that State of import has not prohibited the import of such wastes.

2. Each Party shall take the appropriate measures to:

(a) Ensure that the generation of hazardous wastes and other wastes within it is reduced to a minimum, taking into account social, technological and economic aspects;

(b) Ensure the availability of adequate disposal facilities, for the environmentally sound management of hazardous wastes and other wastes, that shall be located, to the extent possible, within it, whatever the place of their disposal;

(c) Ensure that persons involved in the management of hazardous wastes or other wastes within it take such steps as are necessary to prevent pollution due to hazardous wastes and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment;

(d) Ensure that the transboundary movement of hazardous wastes and other wastes is reduced to the minimum consistent with the environmentally sound and efficient management of such wastes, and is conducted in a manner which will protect human health and the environment against the adverse effects which may result from such movement;

(e) Not allow the export of hazardous wastes or other wastes to a State or group of States belonging to an economic and/or political integration organization that are Parties, particularly developing countries, which have prohibited by their legislation all imports, or if it has reason to believe that the wastes in question will not be managed in an environmentally sound manner, according to criteria to be decided on by the Parties at their first meeting;

(f) Require that information about a proposed transboundary movement of hazardous wastes and other wastes be provided to the States concerned, according to Annex V A, to state clearly the effects of the proposed movement on human health and the environment;

(g) Prevent the import of hazardous wastes and other wastes if it has reason to believe that the wastes in question will not be managed in an environmentally sound manner;

(h) Co-operate in activities with other Parties and interested organizations, directly and through the Secretariat, including the dissemination of information on the transboundary movement of hazardous wastes and other wastes, in order to improve the environmentally sound management of such wastes and to achieve the prevention of illegal traffic.

3. The Parties consider that illegal traffic in hazardous wastes or other wastes is criminal.

4. Each Party shall take appropriate legal, administrative and other measures to implement and enforce the provisions of this Convention, including measures to prevent and punish conduct in contravention of the Convention.

5. A Party shall not permit hazardous wastes or other wastes to be exported to a non-Party or to be imported from a non-Party.

6. The Parties agree not to allow the export of hazardous wastes or other wastes for disposal within the area south of 60° South latitude, whether or not such wastes are subject to transboundary movement.

7. Furthermore, each Party shall:

(a) Prohibit all persons under its national jurisdiction from transporting or disposing of hazardous wastes or other wastes unless such persons are authorized or allowed to perform such types of operations;

(b) Require that hazardous wastes and other wastes that are to be the subject of a transboundary movement be packaged, labelled, and transported in conformity with generally accepted and recognized international rules and standards in the field of packaging, labelling, and transport, and that due account is taken of relevant internationally recognized practices;

(c) Require that hazardous wastes and other wastes be accompanied by a movement document from the point at which a transboundary movement commences to the point of disposal.

8. Each Party shall require that hazardous wastes or other wastes, to be exported, are managed in an environmentally sound manner in the State of import or elsewhere. Technical guidelines for the environmentally sound management of wastes subject to this Convention shall be decided by the Parties at their first meeting.

9. Parties shall take the appropriate measures to ensure that the transboundary movement of hazardous wastes and other wastes only be allowed if:

(a) The State of export does not have the technical capacity and the necessary facilities, capacity or suitable disposal sites in order to dispose of the wastes in question in an environmentally sound and efficient manner; or

(b) The wastes in question are required as a raw material for recycling or recovery industries in the State of import; or

(c) The transboundary movement in question is in accordance with other criteria to be decided by the Parties, provided those criteria do not differ from the objectives of this Convention.

10. The obligation under this Convention of States in which hazardous wastes and other wastes are generated to require that those wastes are managed in an environmentally sound manner may not under any circumstances be transferred to the States of import or transit.

11. Nothing in this Convention shall prevent a Party from imposing additional requirements that are consistent with the provisions of this Convention, and are in accordance with the rules of international law, in order better to protect human health and the environment.

12. Nothing in this Convention shall affect in any way the sovereignty of States over their territorial sea established in accordance with international law, and the sovereign rights and the jurisdiction which States have in their exclusive economic zones and their continental shelves in accordance with international law, and the exercise by ships and aircraft of all States of navigational rights and freedoms as provided for in international law and as reflected in relevant international instruments.

13. Parties shall undertake to review periodically the possibilities for the reduction of the amount and/or the pollution potential of hazardous wastes and other wastes which are exported to other States, in particular to developing countries.

Article 5

Designation of Competent Authorities and Focal Point

To facilitate the implementation of this Convention, the Parties shall:

1. Designate or establish one or more competent authorities and one focal point. One competent authority shall be designated to receive the notification in case of a State of transit.

2. Inform the Secretariat, within three months of the date of the entry into force of this Convention for them, which agencies they have designated as their focal point and their competent authorities.

3. Inform the Secretariat, within one month of the date of decision, of any changes regarding the designation made by them under paragraph 2 above.

Article 6

Transboundary Movement between Parties

1. The State of export shall notify, or shall require the generator or exporter to notify, in writing, through the channel of the competent authority of the State of export, the competent authority of the States concerned of any proposed transboundary movement of hazardous wastes or other wastes. Such notification shall contain the declarations and information specified in Annex V A, written in a language acceptable to the State of import. Only one notification needs to be sent to each State concerned.

2. The State of import shall respond to the notifier in writing, consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information. A copy of the final response of the State of import shall be sent to the competent authorities of the States concerned which are Parties.

3. The State of export shall not allow the generator or exporter to commence the transboundary movement until it has received written confirmation that:

(a) The notifier has received the written consent of the State of import; and

(b) The notifier has received from the State of import confirmation of the existence of a contract between the exporter and the disposer specifying environmentally sound management of the wastes in question.

4. Each State of transit which is a Party shall promptly acknowledge to the notifier receipt of the notification. It may subsequently respond to the notifier in writing, within 60 days, consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information. The State of export shall not allow the transboundary movement to commence until it has received the written consent of the State of transit. However, if at any time a Party decides not to require prior written consent, either generally or under specific conditions, for transit transboundary movements of hazardous wastes or other wastes, or modifies its requirements in this respect, it shall forthwith inform the other Parties of its decision pursuant to Article 13. In this latter case, if no response is received by the State of export within 60 days of the receipt of a given notification by the State of transit, the State of export may allow the export to proceed through the State of transit.

5. In the case of a transboundary movement of wastes where the wastes are legally defined as or considered to be hazardous wastes only:

(a) By the State of export, the requirements of paragraph 9 of this Article that apply to the importer or disposer and the State of import shall apply mutatis mutandis to the exporter and State of export, respectively;

(b) By the State of import, or by the States of import and transit which are Parties, the requirements of paragraphs 1, 3, 4 and 6 of this Article that apply to the exporter and State of export shall apply mutatis mutandis to the importer or disposer and State of import, respectively; or

(c) By any State of transit which is a Party, the provisions of paragraph 4 shall apply to such State.

6. The State of export may, subject to the written consent of the States concerned, allow the generator or the exporter to use a general notification where hazardous wastes or other wastes having the same physical and chemical characteristics are shipped regularly to the same disposer via the same customs office of exit of the State of export via the same customs office of entry of the State of import, and, in the case of transit, via the same customs office of entry and exit of the State or States of transit.

7. The States concerned may make their written consent to the use of the general notification referred to in paragraph 6 subject to the supply of certain information, such as the exact quantities or periodical lists of hazardous wastes or other wastes to be shipped.

8. The general notification and written consent referred to in paragraphs 6 and 7 may cover multiple shipments of hazardous wastes or other wastes during a maximum period of 12 months.

9. The Parties shall require that each person who takes charge of a transboundary movement of hazardous wastes or other wastes sign the movement document either upon delivery or receipt of the wastes in question. They shall also require that the disposer inform both the exporter and the competent authority of the State of export of receipt by the disposer of the wastes in question and, in due course, of the completion of disposal as specified in the notification. If no such information is received within the State of export, the competent authority of the State of export or the exporter shall so notify the State of import.

10. The notification and response required by this Article shall be transmitted to the competent authority of the Parties concerned or to such governmental authority as may be appropriate in the case of non-Parties.

11. Any transboundary movement of hazardous wastes or other wastes shall be covered by insurance, bond or other guarantee as may be required by the State of import or any State of transit which is a Party.

Article 7

Transboundary Movement from a Party through States which are not Parties

Paragraph 1 of Article 6 of the Convention shall apply mutatis mutandis to transboundary movement of hazardous wastes or other wastes from a Party through a State or States which are not Parties.

Article 8

Duty to Re-import

When a transboundary movement of hazardous wastes or other wastes to which the consent of the States concerned has been given, subject to the provisions of this Convention, cannot be completed in accordance with the terms of the contract, the State of export shall ensure that the wastes in question are taken back into the State of export, by the exporter, if alternative arrangements cannot be made for their disposal in an environmentally sound manner, within 90 days from the time that the importing State informed the State of export and the Secretariat, or such other period of time as the States

concerned agree. To this end, the State of export and any Party of transit shall not oppose, hinder or prevent the return of those wastes to the State of export.

Article 9

Illegal Traffic

1. For the purpose of this Convention, any transboundary movement of hazardous wastes or other wastes:

(a) without notification pursuant to the provisions of this Convention to all States concerned; or

(b) without the consent pursuant to the provisions of this Convention of a State concerned; or

(c) with consent obtained from States concerned through falsification, misrepresentation or fraud; or

(d) that does not conform in a material way with the documents; or

(e) that results in deliberate disposal (e.g. dumping) of hazardous wastes or other wastes in contravention of this Convention and of general principles of international law,

shall be deemed to be illegal traffic.

2. In case of a transboundary movement of hazardous wastes or other wastes deemed to be illegal traffic as the result of conduct on the part of the exporter or generator, the State of export shall ensure that the wastes in question are:

(a) taken back by the exporter or the generator or, if necessary, by itself into the State of export, or, if impracticable,

(b) are otherwise disposed of in accordance with the provisions of this Convention,

within 30 days from the time the State of export has been informed about the illegal traffic or such other period of time as States concerned may agree. To this end the Parties concerned shall not oppose, hinder or prevent the return of those wastes to the State of export.

3. In the case of a transboundary movement of hazardous wastes or other wastes deemed to be illegal traffic as the result of conduct on the part of the importer or disposer, the State of import shall ensure that the wastes in question are disposed of in an environmentally sound manner by the importer or disposer or, if necessary, by itself within 30 days from the time the illegal traffic has come to the attention of the State of import or such other period of time as the States concerned may agree. To this end, the Parties concerned shall co-operate, as necessary, in the disposal of the wastes in an environmentally sound manner.

4. In cases where the responsibility for the illegal traffic cannot be assigned either to the exporter or generator or to the importer or disposer, the Parties concerned or other Parties, as appropriate, shall ensure, through co-operation, that the wastes in question are disposed of as soon as possible in an environmentally sound manner either in the State of export or the State of import or elsewhere as appropriate.

5. Each Party shall introduce appropriate national/domestic legislation to prevent and punish illegal traffic. The Parties shall co-operate with a view to achieving the objects of this Article.

Article 10

International Co-operation

1. The Parties shall co-operate with each other in order to improve and achieve environmentally sound management of hazardous wastes and other wastes.

2. To this end, the Parties shall:

(a) Upon request, make available information, whether on a bilateral or multilateral basis, with a view to promoting the environmentally sound management of hazardous wastes and other wastes, including harmonization of technical standards and practices for the adequate management of hazardous wastes and other wastes;

(b) Co-operate in monitoring the effects of the management of hazardous wastes on human health and the environment;

(c) Co-operate, subject to their national laws, regulations and policies, in the development and implementation of new environmentally sound low-waste technologies and the improvement of existing technologies with a view to eliminating, as far as practicable, the generation of hazardous wastes and other wastes and achieving more effective and efficient methods of ensuring their management in an environmentally sound manner, including the study of the economic, social and environmental effects of the adoption of such new or improved technologies;

(d) Co-operate actively, subject to their national laws, regulations and policies, in the transfer of technology and management systems related to the environmentally sound management of hazardous wastes and other wastes. They shall also co-operate in developing the technical capacity among Parties, especially those which may need and request technical assistance in this field;

(e) Co-operate in developing appropriate technical guidelines and/or codes of practice.

3. The Parties shall employ appropriate means to co-operate in order to assist developing countries in the implementation of subparagraphs a, b, c and d of paragraph 2 of Article 4.

4. Taking into account the needs of developing countries, co-operation between Parties and the competent international organizations is encouraged to promote, inter alia, public awareness, the development of sound management of hazardous wastes and other wastes and the adoption of new low-waste technologies.

Article 11

Bilateral, Multilateral and Regional Agreements

1. Notwithstanding the provisions of Article 4 paragraph 5, Parties may enter into bilateral, multilateral, or regional agreements or arrangements regarding transboundary movement of hazardous wastes or other wastes with Parties or non-Parties provided that such agreements or arrangements do not derogate from the environmentally sound management of hazardous wastes and other wastes as required by this Convention. These agreements or arrangements shall stipulate provisions which are not less environmentally sound than those provided for by this Convention in particular taking into account the interests of developing countries.

2. Parties shall notify the Secretariat of any bilateral, multilateral or regional agreements or arrangements referred to in paragraph 1 and those which they have entered into prior to the entry into force of this Convention for them, for the purpose of controlling transboundary movements of hazardous wastes and other wastes which take place entirely among the Parties to such agreements. The provisions of this Convention shall not affect transboundary movements which take place pursuant to such agreements provided that such agreements are compatible with the environmentally

sound management of hazardous wastes and other wastes as required by this Convention.

Article 12

Consultations on Liability

The Parties shall co-operate with a view to adopting, as soon as practicable, a protocol setting out appropriate rules and procedures in the field of liability and compensation for damage resulting from the transboundary movement and disposal of hazardous wastes and other wastes.

Article 13

Transmission of Information

1. The Parties shall, whenever it comes to their knowledge, ensure that, in the case of an accident occurring during the transboundary movement of hazardous wastes or other wastes or their disposal, which are likely to present risks to human health and the environment in other States, those states are immediately informed.

2. The Parties shall inform each other, through the Secretariat, of:

(a) Changes regarding the designation of competent authorities and/or focal points, pursuant to Article 5;

(b) Changes in their national definition of hazardous wastes, pursuant to Article 3; and, as soon as possible,

(c) Decisions made by them not to consent totally or partially to the import of hazardous wastes or other wastes for disposal within the area under their national jurisdiction;

(d) Decisions taken by them to limit or ban the export of hazardous wastes or other wastes;

(e) Any other information required pursuant to paragraph 4 of this Article.

3. The Parties, consistent with national laws and regulations, shall transmit, through the Secretariat, to the Conference of the Parties established under Article 15, before the end of each calendar year, a report on the previous calendar year, containing the following information:

(a) Competent authorities and focal points that have been designated by them pursuant to Article 5;

(b) Information regarding transboundary movements of hazardous wastes or other wastes in which they have been involved, including:

(i) The amount of hazardous wastes and other wastes exported, their category, characteristics, destination, any transit country and disposal method as stated on the response to notification;

(ii) The amount of hazardous wastes and other wastes imported, their category, characteristics, origin, and disposal methods;

(iii) Disposals which did not proceed as intended;

(iv) Efforts to achieve a reduction of the amount of hazardous wastes or other wastes subject to transboundary movement;

(c) Information on the measures adopted by them in implementation of this Convention;

(d) Information on available qualified statistics which have been compiled by them on the effects on human health and the environment of the generation, transportation and disposal of hazardous wastes or other wastes;

(e) Information concerning bilateral, multilateral and regional agreements and arrangements entered into pursuant to Article 11 of this Convention;

(f) Information on accidents occurring during the transboundary movement and disposal of hazardous wastes and other wastes and on the measures undertaken to deal with them;

(g) Information on disposal options operated within the area of their national jurisdiction;

(h) Information on measures undertaken for development of technologies for the reduction and/or elimination of production of hazardous wastes and other wastes; and

(i) Such other matters as the Conference of the Parties shall deem relevant.

4. The Parties, consistent with national laws and regulations, shall ensure that copies of each notification concerning any given transboundary movement of hazardous wastes or other wastes, and the response to it, are sent to the Secretariat when a Party considers that its environment may be affected by that transboundary movement has requested that this should be done.

Article 14

Financial Aspects

1. The Parties agree that, according to the specific needs of different regions and subregions, regional or sub-regional centres for training and technology transfers regarding the management of hazardous wastes and other wastes and the minimization of their generation should be established. The Parties shall decide on the establishment of appropriate funding mechanisms of a voluntary nature.

2. The Parties shall consider the establishment of a revolving fund to assist on an interim basis in case of emergency situations to minimize damage from accidents arising from transboundary movements of hazardous wastes and other wastes or during the disposal of those wastes.

Article 15

Conference of the Parties

1. A Conference of the Parties is hereby established. The first meeting of the Conference of the Parties shall be convened by the Executive Director of UNEP not later than one year after the entry into force of this Convention. Thereafter, ordinary meetings of the Conference of the Parties shall be held at regular intervals to be determined by the Conference at its first meeting.

2. Extraordinary meetings of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that, within six months of the request being communicated to them by the Secretariat, it is supported by at least one third of the Parties.

3. The Conference of the Parties shall by consensus agree upon and adopt rules of procedure for itself and for any subsidiary body it may establish, as well as financial rules to determine in particular the financial participation of the Parties under this Convention.

4. The Parties at their first meeting shall consider any additional measures needed to assist them in fulfilling their responsibilities with respect to the protection and the preservation of the marine environment in the context of this Convention.

5. The Conference of the Parties shall keep under continuous review and evaluation the effective implementation of this Convention, and, in addition, shall:

(a) Promote the harmonization of appropriate policies, strategies and measures for minimizing harm to human health and the environment by hazardous wastes and other wastes;

(b) Consider and adopt, as required, amendments to this Convention and its annexes, taking into consideration, inter alia, available scientific, technical, economic and environmental information;

(c) Consider and undertake any additional action that may be required for the achievement of the purposes of this Convention in the light of experience gained in its operation and in the operation of the agreements and arrangements envisaged in Article 11;

(d) Consider and adopt protocols as required; and

(e) Establish such subsidiary bodies as are deemed necessary for the implementation of this Convention.

6. The United Nations, its specialized agencies, as well as any State not Party to this Convention, may be represented as observers at meetings of the Conference of the Parties. Any other body or agency, whether national or international, governmental or non-governmental, qualified in fields relating to hazardous wastes or other wastes which has informed the Secretariat of its wish to be represented as an observer at a meeting of the Conference of Parties, may be admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

7. The Conference of the Parties shall undertake three years after the entry into force of this Convention, and at least every six years thereafter, an evaluation of its effectiveness and, if deemed necessary, to consider the adoption of a complete or partial ban of transboundary movements of hazardous wastes and other wastes in light of the latest scientific, environmental, technical and economic information.

Article 16

Secretariat

1. The functions of the Secretariat shall be:

(a) To arrange for and service meetings provided for in Articles 15 and 17;

(b) To prepare and transmit reports based upon information received in accordance with Articles 3, 4, 6, 11 and 13 as well as upon information derived from meetings of subsidiary bodies established under Article 15 as well as upon, as appropriate, information provided by relevant intergovernmental and non-governmental entities;

(c) To prepare reports on its activities carried out in implementation of its functions under this Convention and present them to the Conference of the Parties;

(d) To ensure the necessary coordination with relevant international bodies, and in particular to enter into such administrative and contractual arrangements as may be required for the effective discharge

of its function;

(e) To communicate with Focal Points and Competent Authorities established by the Parties in accordance with Article 5 of this Convention;

(f) To compile information concerning authorized national sites and facilities of Parties available for the disposal of their hazardous wastes and other wastes and to circulate this information among Parties;

(g) To receive and convey information from and to Parties on:

-sources of technical assistance and training;
-available technical and scientific know-how;
-sources of advice and expertise; and
-availability of resources

with a view to assisting them, upon request, in such areas as:

-the handling of the notification system of this Convention;
-the management of hazardous wastes and other wastes;
-environmentally sound technologies relating to hazardous wastes and other wastes; such as low- and non-waste technology;
-the assessment of disposal capabilities and sites;
-the monitoring of hazardous wastes and other wastes; and
-emergency responses;

(h) To provide Parties, upon request, with information on consultants or consulting firms having the necessary technical competence in the field, which can assist them to examine a notification for a transboundary movement, the concurrence of a shipment of hazardous wastes or other wastes with the relevant notification, and/or the fact that the proposed disposal facilities for hazardous wastes or other wastes are environmentally sound, when they have reason to believe that the wastes in question will not be managed in an environmentally sound manner. Any such examination would not be at the expense of the Secretariat;

(i) To assist Parties upon request in their identification of cases of illegal traffic and to circulate immediately to the Parties concerned any information it has received regarding illegal traffic;

(j) To co-operate with Parties and with relevant and competent international organizations and agencies in the provision of experts and equipment for the purpose of rapid assistance to States in the event of an emergency situation; and

(k) To perform such other functions relevant to the purposes of this Convention as may be determined by the Conference of the Parties.

2. The Secretariat functions will be carried out on an interim basis by UNEP until the completion of the first meeting of the Conference of the Parties held pursuant to Article 15.

3. At its first meeting, the Conference of the Parties shall designate the Secretariat from among those existing competent intergovernmental organizations which have signified their willingness to carry out the Secretariat functions under this Convention. At this meeting, the Conference of the Parties shall also evaluate the implementation by the interim Secretariat of the functions assigned to it, in particular under paragraph 1 above, and decide upon the structures appropriate for those functions.

Article 17

Amendment of the Convention

1. Any Party may propose amendments to this Convention and any Party to a protocol may propose amendments to that protocol. Such amendments shall take due account, inter alia, of relevant scientific and technical considerations.

2. Amendments to this Convention shall be adopted at a meeting of the Conference of the Parties. Amendments to any protocol shall be adopted at a meeting of the Parties to the protocol in question. The text of any proposed amendment to this Convention or to any protocol, except as may otherwise be provided in such protocol, shall be communicated to the Parties by the Secretariat at least six months before the meeting at which it is proposed for adoption. The Secretariat shall also communicate proposed amendments to the Signatories to this Convention for information.

3. The Parties shall make every effort to reach agreement on any proposed amendment to this Convention by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority of the Parties present and voting at the meeting, and shall be submitted by the Depositary to all Parties for ratification, approval, formal confirmation or acceptance.

4. The procedure mentioned in paragraph 3 above shall apply to amendments to any protocol, except that a two-thirds majority of the Parties to that protocol present and voting at the meeting shall suffice for their adoption.

5. Instruments of ratification, approval, formal confirmation or acceptance of amendments shall be deposited with the Depositary. Amendments adopted in accordance with paragraphs 3 or 4 above shall enter into force between Parties having accepted them on the ninetieth day after the receipt by the Depositary of their instrument of ratification, approval, formal confirmation or acceptance by at least three-fourths of the Parties who accepted them or by at least two thirds of the Parties to the protocol concerned who accepted them, except as may otherwise be provided in such protocol. The amendments shall enter into force for any other Party on the ninetieth day after that Party deposits its instrument of ratification, approval, formal confirmation or acceptance of the amendments.

6. For the purpose of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

Article 18

Adoption and Amendment of Annexes

1. The annexes to this Convention or to any protocol shall form an integral part of this Convention or of such protocol, as the case may be and, unless expressly provided otherwise, a reference to this Convention or its protocols constitutes at the same time a reference to any annexes thereto. Such annexes shall be restricted to scientific, technical and administrative matters.

2. Except as may be otherwise provided in any protocol with respect to its annexes, the following procedure shall apply to the proposal, adoption and entry into force of additional annexes to this Convention or of annexes to a protocol:

(a) Annexes to this Convention and its protocols shall be proposed and adopted according to the procedure laid down in Article 17, paragraphs 2, 3 and 4;

(b) Any Party that is unable to accept an additional annex to this Convention or an annex to any protocol to which it is party shall so notify the Depositary, in writing, within six months from the date of the communication of the adoption by the Depositary. The Depositary shall without delay notify all Parties of any such notification received. A Party may at any time substitute an acceptance for a

previous declaration of objection and the annexes shall thereupon enter into force for that Party;

(c) On the expiry of six months from the date of the circulation of the communication by the Depositary, the annex shall become effective for all Parties to this Convention or to any protocol concerned, which have not submitted a notification in accordance with the provision of subparagraph (b) above.

3. The proposal, adoption and entry into force of amendments to annexes to this Convention or to any protocol shall be subject to the same procedure as for the proposal, adoption and entry into force of annexes to the Convention or annexes to a protocol. Annexes and amendments thereto shall take due account, inter alia, of relevant scientific and technical considerations.

4. If an additional annex or an amendment to an annex involves an amendment to this Convention or to any protocol, the additional annex or amended annex shall not enter into force until such time the amendment to this Convention or to the protocol enters into force.

Article 19

Verification

Any Party which has reason to believe that another Party is acting or has acted in breach of its obligations under this Convention may inform the Secretariat thereof, and in such an event, shall simultaneously and immediately inform, directly or through the Secretariat, the Party against whom the allegations are made. All relevant information should be submitted by the Secretariat to the Parties.

Article 20

Settlement of Disputes

1. In case of a dispute between Parties as to the interpretation or application of, or compliance with, this Convention or any protocol thereto, they shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice.

2. If the Parties concerned cannot settle their dispute through the means mentioned in the preceding paragraph, the dispute, if the Parties to the dispute agree, shall be submitted to the International Court of Justice or to arbitration under the conditions set out in Annex VI on Arbitration. However, failure to reach common agreement on submission of the dispute to the International Court of Justice or to arbitration shall not absolve the Parties from the responsibility of continuing to seek to resolve it by the means referred to in paragraph 1.

3. When ratifying, accepting, approving, formally confirming or acceding to this Convention, or at any time thereafter, a State or political and/or economic integration organization may declare that it recognizes as compulsory ipso facto and without special agreement, in relation to any Party accepting the same obligation:

(a) submission of the dispute to the International Court of Justice; and/or

(b) arbitration in accordance with the procedures set out in Annex VI.

Such declaration shall be notified in writing to the Secretariat which shall communicate it to the Parties.

Article 21

Signature

This Convention shall be open for signature by States, by Namibia, represented by the United Nations Council for Namibia, and by political and/or economic integration organizations, in Basel on 22 March 1989, at the Federal Department of Foreign Affairs of Switzerland in Berne from 23 March 1989 to 30 June 1989 and at United Nations Headquarters in New York from 1 July 1989 to 22 March 1990.

Article 22

Ratification, Acceptance, Formal Confirmation or Approval

1. This Convention shall be subject to ratification, acceptance or approval by States and by Namibia, represented by the United Nations Council for Namibia, and to formal confirmation or approval by political and/or economic integration organizations. Instruments of ratification, acceptance, formal confirmation, or approval shall be deposited with the Depositary.

2. Any organization referred to in paragraph 1 above which becomes a Party to this Convention without any of its members States being a Party shall be bound by all the obligations under the Convention. In the case of such organizations, one or more of whose member States is a Party to the Convention, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention concurrently.

3. In their instruments of formal confirmation or approval, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention. These organizations shall also inform the Depositary, who will inform the Parties of any substantial modification in the extent of their competence.

Article 23

Accession

1. This Convention shall be open for accession by States, by Namibia, represented by the United Nations Council for Namibia, and by political and/or economic integration organizations from the day after the date on which the Convention is closed for signature. The instruments of accession shall be deposited with the Depositary.

2. In their instruments of accession, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention. These organizations shall also inform the Depositary of any substantial modification in the extent of their competence.

3. The provisions of Article 22, paragraph 2, shall apply to political and/or economic integration organizations which accede to this Convention.

Article 24

Right to Vote

1. Except as provided for in paragraph 2 below, each Contracting Party to this Convention shall have one vote.

2. Political and/or economic integration organizations, in matters within their competence, in accordance with Article 22, paragraph 3, and Article 23, paragraph 2, shall exercise their right to vote with a number of votes equal to the number of their member States which are Parties to the Convention or the relevant protocol. Such organizations shall not exercise their right to vote if their member States exercise theirs, and vice versa.

Article 25

Entry into Force

1. This Convention shall enter into force on the ninetieth day after the day of deposit of the twentieth instrument of ratification, acceptance, formal confirmation, approval or accession.

2. For each State or political and/or economic integration organization which ratifies, accepts, approves or formally confirms this Convention or accedes thereto after the date of the deposit of the twentieth instrument of ratification, acceptance, approval, formal confirmation or accession, it shall enter into force on the ninetieth day after the date of deposit by such State or political and/or economic integration organization of its instrument of ratification, acceptance, approval, formal confirmation or accession.

3. For the purpose of paragraphs 1 and 2 above, any instrument deposited by a political and/or economic integration organization shall not be counted as additional to those deposited by member States of such organization.

Article 26

Reservations and Declarations

1. No reservation or exception may be made to this Convention.

2. Paragraph 1 of this Article does not preclude a State or political and/or economic integration organization, when signing, ratifying, accepting, approving, formally confirming or acceding to this Convention, from making declarations or statements, however phrased or named, with a view, inter alia, to the harmonization of its laws and regulations with the provisions of this Convention, provided that such declarations or statements do not purport to exclude or to modify the legal effects of the provisions of the Convention in their application to that State.

Article 27

Withdrawal

1. At any time after three years from the date on which this Convention has entered into force for a Party, that Party may withdraw from the Convention by giving written notification to the Depositary.

2. Withdrawal shall be effective one year from receipt of notification by the Depositary, or on such later date as may be specified in the notification.

Article 28

Depository

The Secretary-General of the United Nations shall be the Depository of this Convention and of any protocol thereto.

Article 29

Authentic texts

The original Arabic, Chinese, English, French, Russian and Spanish texts of this Convention are equally authentic.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

Done at.....on the.....day of.....1989

Annex I

CATEGORIES OF WASTES TO BE CONTROLLED

Waste Streams

Y1 Clinical wastes from medical care in hospitals, medical centers and clinics
Y2 Wastes from the production and preparation of pharmaceutical products
Y3 Waste pharmaceuticals, drugs and medicines
Y4 Wastes from the production, formulation and use of biocides and phytopharmaceuticals
Y5 Wastes from the manufacture, formulation and use of wood preserving chemicals
Y6 Wastes from the production, formulation and use of organic solvents
Y7 Wastes from heat treatment and tempering operations containing cyanides
Y8 Waste mineral oils unfit for their originally intended use
Y9 Waste oils/water, hydrocarbons/water mixtures, emulsions
Y10 Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)
Y11 Waste tarry residues arising from refining, distillation and any pyrolytic treatment
Y12 Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish
Y13 Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives
Y14 Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known
Y15 Wastes of an explosive nature not subject to other legislation
Y16 Wastes from production, formulation and use of photographic chemicals and processing materials
Y17 Wastes resulting from surface treatment of metals and plastics
Y18 Residues arising from industrial waste disposal operations

Wastes having as constituents:

Y19 Metal carbonyls
Y20 Beryllium; beryllium compounds
Y21 Hexavalent chromium compounds
Y22 Copper compounds
Y23 Zinc compounds
Y24 Arsenic; arsenic compounds
Y25 Selenium; selenium compounds
Y26 Cadmium; cadmium compounds

Y27 Antimony; antimony compounds
Y28 Tellurium; tellurium compounds
Y29 Mercury; mercury compounds
Y30 Thallium; thallium compounds
Y31 Lead; lead compounds
Y32 Inorganic fluorine compounds excluding calcium fluoride
Y33 Inorganic cyanides
Y34 Acidic solutions or acids in solid form
Y35 Basic solutions or bases in solid form
Y36 Asbestos (dust and fibres)
Y37 Organic phosphorus compounds
Y38 Organic cyanides
Y39 Phenols; phenol compounds including chlorophenols
Y40 Ethers
Y41 Halogenated organic solvents
Y42 Organic solvents excluding halogenated solvents
Y43 Any congenor of polychlorinated dibenzo-furan
Y44 Any congenor of polychlorinated dibenzo-p-dioxin
Y45 Organohalogen compounds other than substances referred to in this Annex (e.g. Y39, Y41, Y42, Y43, Y44)

Decision IV/9 adopted by the fourth meeting of the Conference of the Parties amended Annex I by adding the following paragraphs (a, b, c and d) to it:

(a) To facilitate the application of this Convention, and subject to paragraphs (b), (c) and (d), wastes listed in Annex VIII are characterized as hazardous pursuant to Article 1, paragraph 1 (a), of this Convention, and wastes listed in Annex IX are not covered by Article 1, paragraph 1 (a), of this Convention.

(b) Designation of a waste on Annex VIII does not preclude, in a particular case, the use of Annex III to demonstrate that a waste is not hazardous pursuant to Article 1, paragraph 1 (a), of this Convention.

(c) Designation of a waste on Annex IX does not preclude, in a particular case, characterization of such a waste as hazardous pursuant to Article 1, paragraph 1 (a), of this Convention if it contains Annex I material to an extent causing it to exhibit an Annex III characteristic.

(d) Annexes VIII and IX do not affect the application of Article 1, paragraph 1 (a), of this Convention for the purpose of characterization of wastes.

Annex II

CATEGORIES OF WASTES REQUIRING SPECIAL CONSIDERATION

Y46 Wastes collected from households
Y47 Residues arising from the incineration of household wastes

Annex III

LIST OF HAZARDOUS CHARACTERISTICS

UN Class[1]	Code	Characteristics

1 H1 Explosive

An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such speed as to cause damage to the surroundings.

3 H3 Flammable liquids

The word "flammable" has the same meaning as "inflammable." Flammable liquids are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5E C, closed-cup test, or not more than 65.6EC, open-cup test. (Since the results of open-cup tests and of closed-cup tests are not strictly comparable and even individual results by the same test are often variable, regulations varying from the above figures to make allowance for such differences would be within the spirit of this definition.)

4.1 H4.1 Flammable solids

Solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction.

4.2 H4.2 Substances or wastes liable to spontaneous combustion

Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.

4.3 H4.3 Substances or wastes which, in contact with water emit flammable gases

Substances or wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

5.1 H5.1 Oxidizing

Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.

5.2 H5.2 Organic Peroxides

Organic substances or wastes which contain the bivalent-O-O- structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.

6.1 H6.1 Poisonous (Acute)

Substances or wastes liable either to cause death or serious injury or to harm health if swallowed or inhaled or by skin contact.

6.2 H6.2 Infectious substances

Substances or wastes containing viable micro organisms or their toxins which are known or suspected to cause disease in animals or humans.

8 H8 Corrosives

Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

9 H10 Liberation of toxic gases in contact with air or water

Substances or wastes which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities.

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[1] Corresponds to the hazard classification system included in the United Nations Recommendations on the Transport of Dangerous Goods (ST/SG/AC.10/1Rev.5, United Nations, New York, 1988).

9 H11 Toxic (Delayed or chronic)

Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity.

9 H12 Ecotoxic

Substances or wastes which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems.

9 H13 Capable, by any means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above.

Tests

The potential hazards posed by certain types of wastes are not yet fully documented; tests to define quantitatively these hazards do not exist. Further research is necessary in order to develop means to characterize potential hazards posed to man and/or the environment by these wastes. Standardized tests have been derived with respect to pure substances and materials. Many countries have developed national tests which can be applied to materials listed in Annex I, in order to decide if these materials exhibit any of the characteristics listed in this Annex.

Annex IV

DISPOSAL OPERATIONS

A. OPERATIONS WHICH DO NOT LEAD TO THE POSSIBILITY OF RESOURCE RECOVERY, RECYCLING, RECLAMATION, DIRECT RE-USE OR ALTERNATIVE USES

Section A encompasses all such disposal operations which occur in practice.

D1 Deposit into or onto land, (e.g., landfill, etc.)
D2 Land treatment, (e.g., biodegradation of liquid or sludgy discards in soils, etc.)
D3 Deep injection, (e.g., injection of pumpable discards into wells, salt domes of naturally occurring repositories, etc.)
D4 Surface impoundment, (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc.)
D5 Specially engineered landfill, (e.g., placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)
D6 Release into a water body except seas/oceans
D7 Release into seas/oceans including sea-bed insertion
D8 Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations in Section A
D9 Physico chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations in Section A, (e.g., evaporation, drying, calcination, neutralization, precipitation, etc.)
D10 Incineration on land
D11 Incineration at sea
D12 Permanent storage (e.g., emplacement of containers in a mine, etc.)
D13 Blending or mixing prior to submission to any of the operations in Section A
D14 Repackaging prior to submission to any of the operations in Section A
D15 Storage pending any of the operations in Section A

B. OPERATIONS WHICH MAY LEAD TO RESOURCE RECOVERY, RECYCLING RECLAMATION, DIRECT RE-USE OR ALTERNATIVE USES

Section B encompasses all such operations with respect to materials legally defined as or considered to be hazardous wastes and which otherwise would have been destined for operations included in Section A

R1 Use as a fuel (other than in direct incineration) or other means to generate energy
R2 Solvent reclamation/regeneration
R3 Recycling/reclamation of organic substances which are not used as solvents
R4 Recycling/reclamation of metals and metal compounds
R5 Recycling/reclamation of other inorganic materials
R6 Regeneration of acids or bases
R7 Recovery of components used for pollution abatement
R8 Recovery of components from catalysts
R9 Used oil re-refining or other reuses of previously used oil
R10 Land treatment resulting in benefit to agriculture or ecological improvement
R11 Uses of residual materials obtained from any of the operations numbered R1-R10
R12 Exchange of wastes for submission to any of the operations numbered R1-R11
R13 Accumulation of material intended for any operation in Section B

Annex V A

INFORMATION TO BE PROVIDED ON NOTIFICATION

1. Reason for waste export

2. Exporter of the waste 1/

3. Generator(s) of the waste and site of generation 1/

4. Disposer of the waste and actual site of disposal 1/

5. Intended carrier(s) of the waste or their agents, if known 1/

6. Country of export of the waste
Competent authority 2/

7. Expected countries of transit
Competent authority 2/

8. Country of import of the waste
Competent authority 2/

9. General or single notification

10. Projected date(s) of shipment(s) and period of time over which waste is to be exported and proposed itinerary (including point of entry and exit) 3/

11. Means of transport envisaged (road, rail, sea, air, inland waters)

12. Information relating to insurance 4/

13. Designation and physical description of the waste including Y number and UN number and its composition 5/ and information on any special handling requirements including emergency provisions

in case of accidents

14. Type of packaging envisaged (e.g. bulk, drummed, tanker)

15. Estimated quantity in weight/volume 6/

16. Process by which the waste is generated 7/

17. For wastes listed in Annex I, classifications from Annex III: hazardous characteristic, H number, and UN class

18. Method of disposal as per Annex IV

19. Declaration by the generator and exporter that the information is correct

20. Information transmitted (including technical description of the plant) to the exporter or generator from the disposer of the waste upon which the latter has based his assessment that there was no reason to believe that the wastes will not be managed in an environmentally sound manner in accordance with the laws and regulations of the country of import.

21. Information concerning the contract between the exporter and disposer.

Notes

1/ Full name and address, telephone or telefax number and the name, address, telephone, telex or telefax number of the person to be contacted.

2/ Full name and address, telephone, telex or telefax number.

3/ In the case of a general notification covering several shipments, either the expected dates of each shipment or, if this is not known, the expected frequency of the shipments will be required.

4/ Information to be provided on relevant insurance requirements and how they are met by exporter, carrier and disposer.

5/ The nature and the concentration of the most hazardous components, in terms of toxicity and other dangers presented by the waste both in handling and in relation to the proposed disposal method.

6/ In the case of a general notification covering several shipments, both the estimated total quantity and the estimated quantities for each individual shipment will be required.

7/ Insofar as this is necessary to assess the hazard and determine the appropriateness of the proposed disposal operation.

Annex V B

INFORMATION TO BE PROVIDED ON THE MOVEMENT DOCUMENT

1. Exporter of the waste 1/

2. Generator(s) of the waste and site of generation 1/

3. Disposer of the waste and actual site of disposal 1/

4. Carrier(s) of the waste 1/ or his agent(s)

5. Subject of general or single notification

6. The date the transboundary movement started and date(s) and signature on receipt by each person who takes charge of the waste

7. Means of transport (road, rail, inland waterway, sea, air) including countries of export, transit and import, also point of entry and exit where these have been designated

8. General description of the waste (physical state, proper UN shipping name and class, UN number, Y number and H number as applicable)

9. Information on special handling requirements including emergency provision in case of accidents

10. Type and number of packages

11. Quantity in weight/volume

12. Declaration by the generator or exporter that the information is correct

13. Declaration by the generator or exporter indicating no objection from the competent authorities of all States concerned which are Parties

14. Certification by disposer of receipt at designated disposal facility and indication of method of disposal and of the approximate date of disposal.

Notes

The information required on the movement document shall where possible be integrated in one document with that required under transport rules. Where this is not possible the information should complement rather than duplicate that required under the transport rules. The movement document shall carry instructions as to who is to provide information and fill-out any form.

1/ Full name and address, telephone or telefax number and the name, address, telephone, telex or telefax number of the person to be contacted in case of emergency.

Annex VI

ARBITRATION

Article 1

Unless the agreement referred to in Article 20 of the Convention provides otherwise, the arbitration procedure shall be conducted in accordance with Articles 2 to 10 below.

Article 2

The claimant party shall notify the Secretariat that the Parties have agreed to submit the dispute to arbitration pursuant to paragraph 2 or paragraph 3 of Article 20 and include, in particular, the Articles of the Convention the interpretation or application of which are at issue. The Secretariat shall forward the information thus received to all Parties to the Convention.

Article 3

The arbitral tribunal shall consist of three members. Each of the Parties to the dispute shall appoint an arbitrator, and the two arbitrators so appointed shall designate by common agreement the third arbitrator, who shall be the chairman of the tribunal. The latter shall not be a national of one of the Parties to the dispute, nor have his usual place of residence in the territory of one of these Parties, nor be employed by any of them, nor have dealt with the case in any other capacity.

Article 4

1. If the chairman of the arbitral tribunal has not been designated within two months of the appointment of the second arbitrator, the Secretary-General of the United Nations shall, at the request of either Party, designate him within a further two months period.

2. If one of the Parties to the dispute does not appoint an arbitrator within two months of the receipt of the request, the other Party may inform the Secretary-General of the United Nations who shall designate the chairman of the arbitral tribunal within a further two months' period. Upon designation, the chairman of the arbitral tribunal shall request the Party which has not appointed an arbitrator to do so within two months. After such period, he shall inform the Secretary-General of the United Nations, who shall make this appointment within a further two months' period.

Article 5

1. The arbitral tribunal shall render its decision in accordance with international law and in accordance with the provisions of this Convention.

2. Any arbitral tribunal constituted under the provisions of this Annex shall draw up its own rules of procedure.

Article 6

1. The decisions of the arbitral tribunal both on procedure and on substance, shall be taken by majority vote of its members.

2. The tribunal may take all appropriate measures in order to establish the facts. It may, at the request of one of the Parties, recommend essential interim measures of protection.

3. The Parties to the dispute shall provide all facilities necessary for the effective conduct of the proceedings.

4. The absence or default of a Party in the dispute shall not constitute an impediment to the proceedings.

Article 7

The tribunal may hear and determine counter-claims arising directly out of the subject-matter of the dispute.

Article 8

Unless the arbitral tribunal determines otherwise because of the particular circumstances of the case, the expenses of the tribunal, including the remuneration of its members, shall be borne by the Parties to the dispute in equal shares. The tribunal shall keep a record of all its expenses, and shall furnish a final statement thereof to the Parties.

Article 9

Any Party that has an interest of a legal nature in the subject-matter of the dispute which may be

affected by the decision in the case, may intervene in the proceedings with the consent of the tribunal.

Article 10

1. The tribunal shall render its award within five months of the date on which it is established unless it finds it necessary to extend the time-limit for a period which should not exceed five months.

2. The award of the arbitral tribunal shall be accompanied by a statement of reasons. It shall be final and binding upon the Parties to the dispute.

3. Any dispute which may arise between the Parties concerning the interpretation or execution of the award may be submitted by either Party to the arbitral tribunal which made the award or, if the latter cannot be seized thereof, to another tribunal constituted for this purpose in the same manner as the first.

Annex VII

[not yet entered into force][2]

Parties and other States which are members of OECD, EC, Liechtenstein.

Annex VIII

LIST A

Wastes contained in this Annex are characterized as hazardous under Article 1, paragraph 1 (a), of this Convention, and their designation on this Annex does not preclude the use of Annex III to demonstrate that a waste is not hazardous.

A1 Metal and metal-bearing wastes

A1010 Metal wastes and waste consisting of alloys of any of the following:

• Antimony

[2] Annex VII is an integral part of the Amendment adopted by the third meeting of the Conference of Parties in 1995 in its Decision III/1. The Amendment is not yet in force. The text of the Decision III/1 is the following:

The Conference

Decides to adopt the following amendment to the Convention:

"Insert new preambular paragraph 7 bis:

Recognizing that transboundary movements of hazardous wastes, especially to developing countries, have a h igh risk of not constituting an environmentally sound management of hazardous wastes as required by this Convention;
Insert new Article 4A:

1. Each Party listed in Annex VII shall prohibit all transboundary movements of hazardous wastes which are destined for operations according to Annex IV A, to States not listed in Annex VII.

2. Each Party listed in Annex VII shall phase out by 31 December 1997, and prohibit as of that date, all transboundary movements of hazardous wastes under Article 1(I)(a) of the Convention which are destined for operations according to Annex IV B to States not listed in Annex VII. Such transboundary movement shall not be prohibited unless the wastes in question are characterised as hazardous under the Convention.

- Arsenic
- Beryllium
- Cadmium
- Lead
- Mercury
- Selenium
- Tellurium
- Thallium

but excluding such wastes specifically listed on list B.

A1020 Waste having as constituents or contaminants, excluding metal waste in massive form, any of the following:

- Antimony; antimony compounds
- Beryllium; beryllium compounds
- Cadmium; cadmium compounds
- Lead; lead compounds
- Selenium; selenium compounds
- Tellurium; tellurium compounds

A1030 Wastes having as constituents or contaminants any of the following:

- Arsenic; arsenic compounds
- Mercury; mercury compounds
- Thallium; thallium compounds

A1040 Wastes having as constituents any of the following:

- Metal carbonyls
- Hexavalent chromium compounds

A1050 Galvanic sludges

A1060 Waste liquors from the pickling of metals

A1070 Leaching residues from zinc processing, dust and sludges such as jarosite, hematite, etc.

A1080 Waste zinc residues not included on list B, containing lead and cadmium in concentrations sufficient to exhibit Annex III characteristics

A1090 Ashes from the incineration of insulated copper wire

A1100 Dusts and residues from gas cleaning systems of copper smelters

A1110 Spent electrolytic solutions from copper electrorefining and electrowinning operations

A1120 Waste sludges, excluding anode slimes, from electrolyte purification systems in copper electrorefining and electrowinning operations

A1130 Spent etching solutions containing dissolved copper

A1140 Waste cupric chloride and copper cyanide catalysts

A1150 Precious metal ash from incineration of printed circuit boards not included on list B[3]

A1160 Waste lead-acid batteries, whole or crushed

A1170 Unsorted waste batteries excluding mixtures of only list B batteries. Waste batteries not specified on list B containing Annex I constituents to an extent to render them hazardous

A1180 Waste electrical and electronic assemblies or scrap[4] containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB-capacitors, or contaminated with Annex I constituents (e.g., cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annex III (note the related entry on list B B1110)[5]

A2 Wastes containing principally inorganic constituents,
which may contain metals and organic materials

A2010 Glass waste from cathode-ray tubes and other activated glasses

A2020 Waste inorganic fluorine compounds in the form of liquids or sludges but excluding such wastes specified on list B

A2030 Waste catalysts but excluding such wastes specified on list B

A2040 Waste gypsum arising from chemical industry processes, when containing Annex I constituents to the extent that it exhibits an Annex III hazardous characteristic (note the related entry on list B B2080)

A2050 Waste asbestos (dusts and fibres)

A2060 Coal-fired power plant fly-ash containing Annex I substances in concentrations sufficient to exhibit Annex III characteristics (note the related entry on list B B2050)

A3 Wastes containing principally organic constituents,
which may contain metals and inorganic materials

A3010 Waste from the production or processing of petroleum coke and bitumen

A3020 Waste mineral oils unfit for their originally intended use

A3030 Wastes that contain, consist of or are contaminated with leaded anti-knock compound sludges

A3040 Waste thermal (heat transfer) fluids

A3050 Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives excluding such wastes specified on list B (note the related entry on list B B4020)

A3060 Waste nitrocellulose

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[3] Note that mirror entry on list B (B1160) does not specify exceptions.

[4] This entry does not include scrap assemblies from electric power generation.

[5] PCBs are at a concentration level of 50 mg/kg or more.

A3070 Waste phenols, phenol compounds including chlorophenol in the form of liquids or sludges

A3080 Waste ethers not including those specified on list B

A3090 Waste leather dust, ash, sludges and flours when containing hexavalent chromium compounds or biocides (note the related entry on list B B3100)

A3100 Waste paring and other waste of leather or of composition leather not suitable for the manufacture of leather articles containing hexavalent chromium compounds or biocides (note the related entry on list B B3090)

A3110 Fellmongery wastes containing hexavalent chromium compounds or biocides or infectious substances (note the related entry on list B B3110)

A3120 Fluff - light fraction from shredding

A3130 Waste organic phosphorous compounds

A3140 Waste non-halogenated organic solvents but excluding such wastes specified on list B

A3150 Waste halogenated organic solvents

A3160 Waste halogenated or unhalogenated non-aqueous distillation residues arising from organic solvent recovery operations

A3170 Wastes arising from the production of aliphatic halogenated hydrocarbons (such as chloromethane, dichloro-ethane, vinyl chloride, vinylidene chloride, allyl chloride and epichlorhydrin)

A3180 Wastes, substances and articles containing, consisting of or contaminated with polychlorinated biphenyl (PCB), polychlorinated terphenyl (PCT), polychlorinated naphthalene (PCN) or polybrominated biphenyl (PBB), or any other polybrominated analogues of these compounds, at a concentration level of 50 mg/kg or more[6]

A3190 Waste tarry residues (excluding asphalt cements) arising from refining, distillation and any pyrolitic treatment of organic materials

A4 Wastes which may contain either inorganic or organic constituents

A4010 Wastes from the production, preparation and use of pharmaceutical products but excluding such wastes specified on list B

A4020 Clinical and related wastes; that is wastes arising from medical, nursing, dental, veterinary, or similar practices, and wastes generated in hospitals or other facilities during the investigation or treatment of patients, or research projects

A4030 Wastes from the production, formulation and use of biocides and phytopharmaceuticals, including waste pesticides and herbicides which are off-specification, outdated,[7] or unfit for their originally intended use

[6] The 50 mg/kg level is considered to be an internationally practical level for all wastes. However, many individual countries have established lower regulatory levels (e.g., 20 mg/kg) for specific wastes.

[7] "Outdated" means unused within the period recommended by the manufacturer.

A4040 Wastes from the manufacture, formulation and use of wood-preserving chemicals[8]

A4050 Wastes that contain, consist of or are contaminated with any of the following:

- Inorganic cyanides, excepting precious-metal-bearing residues in solid form containing traces of inorganic cyanides
- Organic cyanides

A4060 Waste oils/water, hydrocarbons/water mixtures, emulsions

A4070 Wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish excluding any such waste specified on list B (note the related entry on list B B4010)

A4080 Wastes of an explosive nature (but excluding such wastes specified on list B)

A4090 Waste acidic or basic solutions, other than those specified in the corresponding entry on list B (note the related entry on list B B2120)

A4100 Wastes from industrial pollution control devices for cleaning of industrial off-gases but excluding such wastes specified on list B

A4110 Wastes that contain, consist of or are contaminated with any of the following:

- Any congenor of polychlorinated dibenzo-furan
- Any congenor of polychlorinated dibenzo-dioxin

A4120 Wastes that contain, consist of or are contaminated with peroxides

A4130 Waste packages and containers containing Annex I substances in concentrations sufficient to exhibit Annex III hazard characteristics

A4140 Waste consisting of or containing off specification or outdated[9] chemicals corresponding to Annex I categories and exhibiting Annex III hazard characteristics

A4150 Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on human health and/or the environment are not known

A4160 Spent activated carbon not included on list B (note the related entry on list B B2060)

Annex IX

LIST B

Wastes contained in the Annex will not be wastes covered by Article 1, paragraph 1 (a), of this Convention unless they contain Annex I material to an extent causing them to exhibit an Annex III characteristic.

B1 Metal and metal-bearing wastes

[8] This entry does not include wood treated with wood preserving chemicals.

[9] "Outdated" means unused within the period recommended by the manufacturer.

B1010 Metal and metal-alloy wastes in metallic, non-dispersible form:

- Precious metals (gold, silver, the platinum group, but not mercury)
- Iron and steel scrap
- Copper scrap
- Nickel scrap
- Aluminium scrap
- Zinc scrap
- Tin scrap
- Tungsten scrap
- Molybdenum scrap
- Tantalum scrap
- Magnesium scrap
- Cobalt scrap
- Bismuth scrap
- Titanium scrap
- Zirconium scrap
- Manganese scrap
- Germanium scrap
- Vanadium scrap
- Scrap of hafnium, indium, niobium, rhenium and gallium
- Thorium scrap
- Rare earths scrap

B1020 Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc), of:

- Antimony scrap
- Beryllium scrap
- Cadmium scrap
- Lead scrap (but excluding lead-acid batteries)
- Selenium scrap
- Tellurium scrap

B1030 Refractory metals containing residues

B1040 Scrap assemblies from electrical power generation not contaminated with lubricating oil, PCB or PCT to an extent to render them hazardous

B1050 Mixed non-ferrous metal, heavy fraction scrap, not containing Annex I materials in concentrations sufficient to exhibit Annex III characteristics[10]

B1060 Waste selenium and tellurium in metallic elemental form including powder

B1070 Waste of copper and copper alloys in dispersible form, unless they contain Annex I constituents to an extent that they exhibit Annex III characteristics

B1080 Zinc ash and residues including zinc alloys residues in dispersible form unless containing Annex I constituents in concentration such as to exhibit Annex III characteristics or exhibiting hazard characteristic H4.3[11]

[10] Note that even where low level contamination with Annex I materials initially exists, subsequent processes, including recycling processes, may result in separated fractions containing significantly enhanced concentrations of those Annex I materials.

[11] The status of zinc ash is currently under review and there is a recommendation with the United Nations

B1090 Waste batteries conforming to a specification, excluding those made with lead, cadmium or mercury

B1100 Metal-bearing wastes arising from melting, smelting and refining of metals:

- Hard zinc spelter
- Zinc-containing drosses:

  - Galvanizing slab zinc top dross (>90% Zn)
  - Galvanizing slab zinc bottom dross (>92% Zn)
  - Zinc die casting dross (>85% Zn)
  - Hot dip galvanizers slab zinc dross (batch)(>92% Zn)
  - Zinc skimmings

- Aluminium skimmings (or skims) excluding salt slag
- Slags from copper processing for further processing or refining not containing arsenic, lead or cadmium to an extend that they exhibit Annex III hazard characteristics
- Wastes of refractory linings, including crucibles, originating from copper smelting
- Slags from precious metals processing for further refining
- Tantalum-bearing tin slags with less than 0.5% tin

B1110 Electrical and electronic assemblies:

- Electronic assemblies consisting only of metals or alloys
- Waste electrical and electronic assemblies or scrap[12] (including printed circuit boards) not containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB-capacitors, or not contaminated with Annex I constituents (e.g., cadmium, mercury, lead, polychlorinated biphenyl) or from which these have been removed, to an extent that they do not possess any of the characteristics contained in Annex III (note the related entry on list A A1180)

- Electrical and electronic assemblies (including printed circuit boards, electronic components and wires) destined for direct reuse,[13] and not for recycling or final disposal[14]

B1120 Spent catalysts excluding liquids used as catalysts, containing any of:

Transition metals, excluding waste catalysts (spent catalysts, liquid used catalysts or other catalysts) on list A:	Scandium Vanadium Manganese Cobalt Copper Yttrium Niobium Hafnium Tungsten	Titanium Chromium Iron Nickel Zinc Zirconium Molybdenum Tantalum Rhenium

Conference on Trade and Development (UNCTAD) that zinc ashes should not be dangerous goods.

[12] This entry does not include scrap from electrical power generation.

[13] Reuse can include repair, refurbishment or upgrading, but not major reassembly.

[14] In some countries these materials destined for direct re-use are not considered wastes.

Lanthanides (rare earth metals):	Lanthanum Praseodymium Samarium Gadolinium Dysprosium Erbium Ytterbium	Cerium Neody Europium Terbium Holmium Thulium Lutetium

B1130 Cleaned spent precious-metal-bearing catalysts

B1140 Precious-metal-bearing residues in solid form which contain traces of inorganic cyanides

B1150 Precious metals and alloy wastes (gold, silver, the platinum group, but not mercury) in a dispersible, non-liquid form with appropriate packaging and labelling

B1160 Precious-metal ash from the incineration of printed circuit boards (note the related entry on list A A1150)

B1170 Precious-metal ash from the incineration of photographic film

B1180 Waste photographic film containing silver halides and metallic silver

B1190 Waste photographic paper containing silver halides and metallic silver

B1200 Granulated slag arising from the manufacture of iron and steel

B1210 Slag arising from the manufacture of iron and steel including slags as a source of TiO_2 and vanadium

B1220 Slag from zinc production, chemically stabilized, having a high iron content (above 20%) and processed according to industrial specifications (e.g., DIN 4301) mainly for construction

B1230 Mill scaling arising from the manufacture of iron and steel

B1240 Copper oxide mill-scale

B2 Wastes containing principally inorganic constituents, which may contain metals and organic materials

B2010 Wastes from mining operations in non-dispersible form:

- Natural graphite waste
- Slate waste, whether or not roughly trimmed or merely cut, by sawing or otherwise
- Mica waste
- Leucite, nepheline and nepheline syenite waste
- Feldspar waste
- Fluorspar waste
- Silica wastes in solid form excluding those used in foundry operations

B2020 Glass waste in non-dispersible form:

- Cullet and other waste and scrap of glass except for glass from cathode-ray tubes and other activated glasses

B2030 Ceramic wastes in non-dispersible form:

- Cermet wastes and scrap (metal ceramic composites)
- Ceramic based fibres not elsewhere specified or included

B2040 Other wastes containing principally inorganic constituents:

- Partially refined calcium sulphate produced from flue-gas desulphurization (FGD)
- Waste gypsum wallboard or plasterboard arising from the demolition of buildings
- Slag from copper production, chemically stabilized, having a high iron content (above 20%) and processed according to industrial specifications (e.g., DIN 4301 and DIN 8201) mainly for construction and abrasive applications
- Sulphur in solid form
- Limestone from the production of calcium cyanamide (having a pH less than 9)
- Sodium, potassium, calcium chlorides
- Carborundum (silicon carbide)
- Broken concrete
- Lithium-tantalum and lithium-niobium containing glass scraps

B2050 Coal-fired power plant fly-ash, not included on list A (note the related entry on list A A2060)

B2060 Spent activated carbon resulting from the treatment of potable water and processes of the food industry and vitamin production (note the related entry on list A A4160)

B2070 Calcium fluoride sludge

B2080 Waste gypsum arising from chemical industry processes not included on list A (note the related entry on list A A2040)

B2090 Waste anode butts from steel or aluminium production made of petroleum coke or bitumen and cleaned to normal industry specifications (excluding anode butts from chlor alkali electrolyses and from metallurgical industry)

B2100 Waste hydrates of aluminium and waste alumina and residues from alumina production excluding such materials used for gas cleaning, flocculation or filtration processes

B2110 Bauxite residue ("red mud") (pH moderated to less than 11.5)

B2120 Waste acidic or basic solutions with a pH greater than 2 and less than 11.5, which are not corrosive or otherwise hazardous (note the related entry on list A A4090)

B3 Wastes containing principally organic constituents, which may contain metals and inorganic materials

B3010 Solid plastic waste:

The following plastic or mixed plastic materials, provided they are not mixed with other wastes and are prepared to a specification:

- Scrap plastic of non-halogenated polymers and co-polymers, including but not limited to the following[15]:

  - ethylene
  - styrene

[15] It is understood that such scraps are completely polymerized.

- polypropylene
- polyethylene terephthalate
- acrylonitrile
- butadiene
- polyacetals
- polyamides
- polybutylene terephthalate
- polycarbonates
- polyethers
- polyphenylene sulphides
- acrylic polymers
- alkanes C10-C13 (plasticiser)
- polyurethane (not containing CFCs)
- polysiloxanes
- polymethyl methacrylate
- polyvinyl alcohol
- polyvinyl butyral
- polyvinyl acetate

• Cured waste resins or condensation products including the following:

- urea formaldehyde resins
- phenol formaldehyde resins
- melamine formaldehyde resins
- epoxy resins
- alkyd resins
- polyamides

• The following fluorinated polymer wastes[16]

- perfluoroethylene/propylene (FEP)
- perfluoroalkoxy alkane (PFA)
- perfluoroalkoxy alkane (MFA)
- polyvinylfluoride (PVF)
- polyvinylidenefluoride (PVDF)

B3020 Paper, paperboard and paper product wastes

The following materials, provided they are not mixed with hazardous wastes:

Waste and scrap of paper or paperboard of:

• unbleached paper or paperboard or of corrugated paper or paperboard
• other paper or paperboard, made mainly of bleached chemical pulp, not coloured in the mass
• paper or paperboard made mainly of mechanical pulp (for example, newspapers, journals and similar printed matter)
• other, including but not limited to 1) laminated paperboard 2) unsorted scrap.

B3030 Textile wastes

The following materials, provided they are not mixed with other wastes and are prepared to a specification:

[16] Post-consumer wastes are excluded from this entry: - Wastes shall not be mixed - Problems arising from open-burning practices to be considered

- Silk waste (including cocoons unsuitable for reeling, yarn waste and garnetted stock)

    - not carded or combed
    - other

- Waste of wool or of fine or coarse animal hair, including yarn waste but excluding garnetted stock

    - noils of wool or of fine animal hair
    - other waste of wool or of fine animal hair
    - waste of coarse animal hair

- Cotton waste (including yarn waste and garnetted stock)

    - yarn waste (including thread waste)
    - garnetted stock
    - other

- Flax tow and waste
- Tow and waste (including yarn waste and garnetted stock) of true hemp (Cannabis sativa L.)
- Tow and waste (including yarn waste and garnetted stock) of jute and other textile bast fibres (excluding flax, true hemp and ramie)
- Tow and waste (including yarn waste and garnetted stock) of sisal and other textile fibres of the genus Agave
- Tow, noils and waste (including yarn waste and garnetted stock) of coconut
- Tow, noils and waste (including yarn waste and garnetted stock) of abaca (Manila hemp or Musa textilis Nee)
- Tow, noils and waste (including yarn waste and garnetted stock) of ramie and other vegetable textile fibres, not elsewhere specified or included
- Waste (including noils, yarn waste and garnetted stock) of man-made fibres

    - of synthetic fibres
    - of artificial fibres

- Worn clothing and other worn textile articles
- Used rags, scrap twine, cordage, rope and cables and worn out articles of twine, cordage, rope or cables of textile materials

    - sorted
    - other

B3040 Rubber wastes

The following materials, provided they are not mixed with other wastes:

- Waste and scrap of hard rubber (e.g., ebonite)
- Other rubber wastes (excluding such wastes specified elsewhere)

B3050 Untreated cork and wood waste:

- Wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms
- Cork waste: crushed, granulated or ground cork

B3060 Wastes arising from agro-food industries provided it is not infectious:

- Wine lees
- Dried and sterilized vegetable waste, residues and byproducts, whether or not in the form of pellets, of

a kind used in animal feeding, not elsewhere specified or included
- Degras: residues resulting from the treatment of fatty substances or animal or vegetable waxes
- Waste of bones and horn-cores, unworked, defatted, simply prepared (but not cut to shape), treated with acid or degelatinised
- Fish waste
- Cocoa shells, husks, skins and other cocoa waste
- Other wastes from the agro-food industry excluding by-products which meet national and international requirements and standards for human or animal consumption

B3070 The following wastes:

- Waste of human hair
- Waste straw
- Deactivated fungus mycelium from penicillin production to be used as animal feed

B3080 Waste parings and scrap of rubber

B3090 Paring and other wastes of leather or of composition leather not suitable for the manufacture of leather articles, excluding leather sludges, not containing hexavalent chromium compounds and biocides (note the related entry on list A A3100)

B3100 Leather dust, ash, sludges or flours not containing hexavalent chromium compounds or biocides (note the related entry on list A A3090)

B3110 Fellmongery wastes not containing hexavalent chromium compounds or biocides or infectious substances (note the related entry on list A A3110)

B3120 Wastes consisting of food dyes

B3130 Waste polymer ethers and waste non-hazardous monomer ethers incapable of forming peroxides

B3140 Waste pneumatic tyres, excluding those destined for Annex IVA operations

B4 Wastes which may contain either inorganic or organic constituents

B4010 Wastes consisting mainly of water-based/latex paints, inks and hardened varnishes not containing organic solvents, heavy metals or biocides to an extent to render them hazardous (note the related entry on list A A4070)

B4020 Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives, not listed on list A, free of solvents and other contaminants to an extent that they do not exhibit Annex III characteristics, e.g., water-based, or glues based on casein starch, dextrin, cellulose ethers, polyvinyl alcohols (note the related entry on list A A3050)

B4030 Used single-use cameras, with batteries not included on list A

DECISIONS ADOPTED BY THE FIRST MEETING OF THE CONFERENCE OF THE PARTIES

in Piriapolis, Uruguay on 4 December 1992

I/1. RULES OF PROCEDURE

The Conference

1. Adopts the rules of procedure attached to the report of the First Meeting of the Conference of the Parties to the Basel Convention as Annex III;

2. Decides that the Second Meeting of the Conference of the Parties shall take place in February/March 1994;

3. Further decides that the Third Meeting of the Conference of the Parties shall take place in April/May 1995.

I/2. MECHANISMS FOR THE IMPLEMENTATION OF THE BASEL CONVENTION

The Conference

Recalling Resolution 1 of the March 1989 Basel Conference of Plenipotentiaries on the Global Convention on the Control of Transboundary Movements of Hazardous Wastes inviting the Executive Director of UNEP to set up an ad hoc working group of legal and technical experts to consider the necessity of establishing mechanisms for the implementation of the Basel Convention as provided in Article 15, paragraph 5 (e) of the Convention,

Having considered the recommendations of the ad hoc working group in document UNEP/CHW/WG.3/1/4,

1. Decides to establish an Open-ended Ad Hoc Committee to meet as necessary in order to fulfil the task placed on it by the Conference of the Parties, subject to available resources;

2. Requests the Open-ended Ad Hoc Committee to fulfil the tasks placed on it by this decision and decisions I/3, I/7, 9, 11, 13, 15 and 19, and to present a report on its work to the Second Meeting of the Conference of the Parties;

3. Requests the Secretariat of the Basel Convention to convene the Open-ended Ad Hoc Committee and any subgroups the Ad Hoc Committee needs to establish to facilitate its work subject to available resources.

I/3. MANUAL FOR THE IMPLEMENTATION OF THE CONVENTION

The Conference

Having considered the recommendation concerning the need for an Implementation Manual/Code of Practice/Guidelines contained in document UNEP/CHW/WG.3/1/4,

Requests the Secretariat of the Basel Convention to identify the purposes of and to prepare the outline for a manual, in consultation with the Open-ended Ad Hoc Committee, and to report on its progress to the Second Meeting of the Conference of the Parties.

I/4. RELATIONSHIP OF THE BASEL CONVENTION AND THE CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER, 1972[17]

The Conference

Recalling Resolution 2 of the March 1989 Basel Conference of Plenipotentiaries inviting the Executive Director of UNEP to bring to the attention of the Parties to the London Dumping Convention the need for a review of the existing rules, regulations and practices with respect to dumping of hazardous wastes and other wastes at sea in the light of the Basel Convention,

Taking note of the report of the Executive Director in document UNEP/CHW.1/2,

1. Welcomes the response of the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, in response to Resolution 2 of the Basel Convention;

2. Invites the 16th Consultative Meeting of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (LDC), as well as the 1994 Conference on amending the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, to consider the measures embodied in LDC Resolutions 29(10), 39(13), 42(13) and 43(13) in the possible amendments to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, or its annexes;

3. Further invites all Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, which are not Parties to the Basel Convention to become Parties to the Basel Convention;

4. Requests the Secretariat of the Basel Convention to ensure that the technical standards of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, be fully taken into account during the further development of technical guidelines for the environmentally sound management of wastes subject to the Basel Convention.

I/5. LIABILITY AND COMPENSATION

The Conference

Recalling Resolution 3 of the March 1989 Basel Conference of Plenipotentiaries, requesting the Executive Director of UNEP to establish an ad hoc working group of legal and technical experts to develop elements which might be included in a protocol on liability and compensation for damage resulting from the transboundary movement and disposal of hazardous wastes and other wastes and to report on the results of this group's work to the First Meeting of the Parties,

Having considered the reports of the ad hoc working group contained in documents UNEP/CHW/WG.1/3 and UNEP/CHW/WG.1/2/3 as well as the reports of the Executive Director of

[17] The informal name of the Convention was changed from the "London Dumping Convention" (LDC) to the "London Convention, 1972" (LC, 1972) (Fifteenth Consultative Meeting of the Contracting Parties to the Convention) (November 1992).

UNEP contained in documents UNEP/CHW.1/2 and UNEP/CHW.1/4,

1. Notes with appreciation the report of the ad hoc working group contained in documents UNEP/CHW/WG.1/3 and UNEP/CHW/WG.1/2/3 and the reports of the Executive Director in documents UNEP/CHW.1/2 and UNEP/CHW.1/4;

2. Decides to establish an ad hoc working group of legal and technical experts to consider and develop, having regard to documents UNEP/CHW/WG.1/3, UNEP/CHW/WG.1/2/3, UNEP/CHW.1/5 and UNEP/CHW.1/11 and other relevant instruments and documents, a draft protocol on liability and compensation, possibly including the establishment of an International Fund for compensation for damage resulting from the transboundary movements of hazardous wastes and their disposal;

3. Decides also that the Working Group, at its first meeting, should consider, inter alia, the adequacy of the factual basis on which further efforts can best proceed, take the steps necessary to improve this information, and keep the matter under review at subsequent meetings;

4. Requests the Secretariat of the Basel Convention to convene this group which shall report on the progress of its work to the Second Meeting of the Conference of the Parties to the Basel Convention to facilitate the adoption of the protocol referred to in paragraph 2 above.

I/6. HARMONIZATION OF PROCEDURES OF THE BASEL CONVENTION AND THE CODE OF PRACTICE ON THE INTERNATIONAL TRANSBOUNDARY MOVEMENT OF RADIOACTIVE WASTE

The Conference

Recalling Resolution 5 of the March 1989 Basel Conference of Plenipotentiaries on the need to harmonize the procedures of the Basel Convention and the code of practice for international transboundary movement of radioactive waste,

Having considered the report of the Executive Director of UNEP contained in document UNEP/CHW.1/2,

1. Welcomes the adoption by the General Conference of the International Atomic Centre Energy Agency (IAEA) of the code of practice which affirms the general principles and objectives of the Basel Convention;

2. Supports decision GC(XXXIV) Res/530 dated October 1990 of the General Conference of the IAEA to keep the question of international transboundary movements of radioactive waste under active review, including the desirability of concluding a legally binding instrument under the auspices of the IAEA;

3. Requests the Secretariat of the Basel Convention to continue its cooperation and exchange of information with the IAEA on the matters referred to in paragraph 2 above.

I/7. INSTITUTIONAL AND FINANCIAL ARRANGEMENTS

The Conference

Recalling paragraph 3 of Article 16 of the Basel Convention stipulating that at its first meeting the Conference of the Parties shall designate the Secretariat from among those existing competent intergovernmental organizations which have signalled their willingness to carry out the Secretariat functions under this Convention,

Having considered the note of the Executive Director of the United Nations Environment Programme in document UNEP/CHW.1/9 and its corrigenda,

1. Requests the United Nations Environment Programme to carry out the functions of the Basel Convention Secretariat;

2. Further requests the Executive Director of UNEP to establish the Secretariat in accordance with the structure contained in the budget and to have the Secretariat located in Geneva;

3. Approves the budget of the Convention and its Secretariat for 1993 and 1994 as included in the Annex I of this decision;

4. Decides that the contributions of the Parties to the budget of the Convention and its Secretariat shall be according to the formula in the annex to this decision and subject to consideration by the Open-ended Ad Hoc Committee of the distribution of the contributions for 1994;

5. Invites the Secretary-General of the United Nations to establish a Trust Fund for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and a technical cooperation trust fund to support developing countries and other countries in need of technical assistance in the implementation of the Basel Convention, in accordance with the financial regulations and rules of the United Nations, the general procedures governing the operations of the Environment Fund of the United Nations Environment Programme and the terms of reference for the administration of these Trust Funds to receive the contributions of the Parties for the implementation of the Convention (attached in Annex II to this decision);

6. Calls on Parties and non-Parties which agreed to contribute to pay their contributions as soon as possible so as to ensure the smooth functioning of the Secretariat and the implementation of the decisions of the Conference of the Parties;

7. Requests the Executive Director of UNEP to inform the Parties and non-Parties on the financial changes in the implementation of the Basel Convention and to request them to pay their contributions into the respective trust funds as soon as possible.

Annex

TERMS OF REFERENCE FOR THE ADMINISTRATION OF THE TRUST FUNDS FOR THE BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

1. A Trust Fund for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (hereinafter referred to as the Trust Fund) shall be established to provide financial support for the ordinary expenditure of the Secretariat of the Basel Convention. A Technical Cooperation Trust Fund (hereinafter referred to as the Technical Trust Fund) shall be established to assist developing countries and other countries in need of technical assistance in the implementation of the Basel Convention.

2. Pursuant to the Financial Regulations and Rules of the United Nations, the Executive Director of the United Nations Environment Programme (UNEP), with the approval of the Governing Council of UNEP, shall establish the Trust Funds for the administration of the Convention.

3. The Trust Fund shall be established for an initial period of two years, beginning 1 January 1993 and ending 31 December 1994. The appropriations of the Trust Fund for this period shall be financed from:

(a) Contributions made by the Parties to the Convention, by reference to the Table attached as an Appendix to the Budget, including additional contributions and contributions from any new Parties which are to be added to the Table;

(b) Contributions from States not Party to the Convention, other governmental, intergovernmental and non-governmental organizations, and other sources.

4. The Technical Trust Fund shall be established for an initial period of two years, beginning 1 January 1993 and ending 31 December 1994. The appropriation of the Technical Trust Fund for this period shall be financed from contributions made by the Parties and the non-Parties to the Convention.

5. The contributions referred to in Article 3 (a) above are to be based on the United Nations scale of assessments for the apportionment of the expenses of the United Nations (adjusted to provide that no one contribution shall exceed 25 per cent of the total).

6. The budget estimates, prepared in United States dollars, covering income and expenditure for each of the two calendar years 1993 and 1994 shall be as approved by the First Meeting of the Conference of the Parties to the Convention and further such budget estimates for subsequent periods of two years shall be prepared and approved at any ordinary or extraordinary meeting of the Parties. The Bureau shall prepare a report based on a special survey by the Secretariat for the Open-ended Ad Hoc Committee to review and provisionally adopt contributions to the budget for 1994 by the end of September 1993.

7. The decision of the Conference of the Parties on the budget, including contributions thereto, shall be made by consensus.

8. The Bureau of the Parties may, on the advice of the Executive Director, approve expenditure on any one or more objects of expenditure over and above the level approved by the Conference of the Parties for those objects of expenditure, provided that there shall be no overall increase in the budget above that approved by the Conference of the Parties.

9. Commitments against the resources of the Trust Fund may be made only if they are covered by the necessary income. No commitments shall be made in advance of the receipt of contributions.

10. In the event that the Executive Director of UNEP anticipates that there might be a shortfall in resources over the financial period as a whole, he shall, with the advice of the members of the Bureau, have discretion to adjust the budget so that expenditures are at all times fully covered by contributions received.

11. At the end of a calendar year of a financial period, the Executive Director may transfer any uncommitted balance of appropriations to the following calendar year.

12. All contributions are due to be paid in the year immediately preceding the year to which the contributions relate.

13 All contributions shall be paid in United States dollars into the following account: Account No. 015-002756, UNEP General Trust Funds Account, Chemical Bank, United Nations Branch, New York, N.Y. 10017, United States of America.

14. Contributions from States that become Parties after the beginning of the financial period shall be made *pro rata temporis* for the balance of the financial period.

15. Contributions not immediately required for the purpose of both Funds shall be invested at the discretion of the United Nations and any interest so earned shall be credited to the Fund.

16. The Executive Director shall deduct from the income of both Trust Funds an administrative

support charge equal to 13 per cent of other expenditures recorded during any accounting period in order to meet the cost of administrative activities financed from both Trust Funds and provide services relating to personnel, accounting, audit, etc.

17. The financial period of both Trust Funds will be a biennium consisting of two consecutive calendar years. At the end of each calendar year of a financial period, the Executive Director shall submit to the Parties the certified accounts for the year and a report of activities under the Convention. He shall submit the accounts for the two-year financial period audited by the Board of Auditors of the United Nations as soon as practicable.

18. The General Procedures governing the operations of the Fund of UNEP and the Financial Regulations and Rules of the United Nations and these terms of reference shall govern the financial operations of the Convention.

19. In the event that the Parties wish both Trust Funds to be extended beyond 31 December 1994, the Executive Director of UNEP shall be so requested by the Parties at least six months earlier. Such extension of both Trust Funds shall be subject to the approval of the UNEP Governing Council.

I/8. COOPERATION WITH THE UNITED NATIONS BODIES, SPECIALIZED AGENCIES AND REGIONAL SYSTEMS AND ORGANIZATIONS

The Conference

Conscious of the essential need for the Secretariat of the Basel Convention to co-operate with those of other United Nations bodies, specialized agencies and regional systems and organizations in order to achieve the objectives of the Basel Convention,

Convinced that the elaboration of regional systems for the control of transboundary movements of hazardous wastes and their disposal will strengthen the control regime established by the Basel Convention,

Having considered the report of the Executive Director of UNEP on the relationship of the Secretariat with other United Nations bodies, specialized agencies and regional organizations,

1. Welcomes the adoption of the "Bamako Convention on the ban of import of hazardous wastes into Africa and the control of their transboundary movements within Africa," the Lomé IV Convention "ACP/EEC" and the adoption of the OECD Council decision of 30 March 1992 concerning the control of transfrontier movements of wastes destined for recovery operations;

2. Requests the Secretariat of the Basel Convention to continue its co-operation with all United Nation bodies, specialized agencies and regional systems and organizations and other appropriate organizations in order to achieve the objectives of the Basel Convention.

I/9. BILATERAL, MULTILATERAL AND REGIONAL AGREEMENTS

The Conference

Recalling that Article 11 of the Basel Convention permits Parties to enter into bilateral, multilateral or regional agreements or arrangements regarding the transboundary movement of hazardous wastes or other wastes with Parties or non-Parties provided that such agreements or arrangements do not derogate from the environmentally sound management of hazardous wastes and other wastes as required by the Basel Convention and that these agreements or arrangements shall stipulate provisions which are not less environmentally sound than those provided for by the Convention, in particular taking into account the interest of developing countries,

Having considered document UNEP/CHW.1/16,

1. Requests the Parties to the Basel Convention to notify the Secretariat of the Basel Convention expeditiously of any bilateral, multilateral or regional agreements or arrangements they conclude in accordance with paragraph 2 of Article 11 of the Convention;

2. Also requests its Open-ended Ad Hoc Committee to examine the bilateral, multilateral and regional agreements or arrangements communicated to the Secretariat and to present a report on their conformity with the stipulations of Article 11 of the Convention to the Second Meeting of the Conference of the Parties.

I/10. DESIGNATION OF COMPETENT AUTHORITIES AND FOCAL POINTS

The Conference

Recalling Article 5, which requires the Parties to designate or establish one or more competent authorities and one focal point and to inform the Secretariat of the Basel Convention within three months of the date of the entry into force of the Convention for them of the agencies they have designated as their focal points and their competent authorities,

Having considered document UNEP/CHW.1/13,

Invites Parties which have not yet informed the Secretariat of the designation of their competent authorities and focal points to do so as soon as possible.

I/11. TRANSMISSION OF INFORMATION

The Conference

Recalling Article 13 which requires the Parties to transmit, through the Secretariat of the Basel Convention, to the Conference of the Parties before the end of each calendar year, a report on the implementation of the Convention during the previous calendar year,

Aware that the Parties were not able to fulfil their obligation fully in conformity with Article 13 due to the recent entry into force of the Convention,

1. Takes note of the note of the Executive Director of UNEP on transmission of information in accordance with Article 13 as contained in document UNEP/CHW.1/18;

2. Urges the Parties to the Convention to submit to the Secretariat complete reports in accordance with the requirements of Article 13;

3. Requests the Secretariat to prepare an analytical summary of the reports submitted to it and to present the summary to its Open-ended Ad Hoc Committee for evaluation of the information contained therein and a report on their findings to the Conference of the Parties at its second meeting;

4. Also requests the Secretariat to submit the analytical summary of the reports, together with the comments of the ad hoc committee thereon, to the Second Meeting of the Conference of the Parties for its consideration.

I/12. MODEL NATIONAL LEGISLATION FOR THE TRANSBOUNDARY MOVEMENT AND MANAGEMENT OF HAZARDOUS WASTES

The Conference

Recalling paragraph 4 of Article 4 of the Basel Convention, which requests the Parties to take appropriate legal, administrative and other measures to implement and enforce the provisions of the Convention,

Convinced that an essential element of the fulfilment by the Parties of their obligations under the Convention is to promulgate new or adapt existing laws and regulations in accordance with the provisions of the Basel Convention,

Aware of the need of States to be assisted - upon request - in the formulation of their law and the development of institutional arrangements in the field of hazardous wastes, in particular in the implementation of the Basel Convention,

1. Takes note of the report of the meeting of experts on model national legislation contained in document UNEP/CHW.1/10 and of the elements of both the model law on the management of hazardous wastes and the model law on the control of transboundary movements of hazardous wastes and other wastes and their disposal as reflected in Annexes I and II to that report;

2. Requests the Secretariat of the Basel Convention to continue its work on development of the model national legislation, taking account of the experience of States;

3. Urges Parties which have not yet developed laws and regulations in conformity with the provisions of the Basel Convention to do so, taking into consideration the model laws referred to in paragraph 1;

I/13. ESTABLISHMENT OF REGIONAL CENTRES FOR TRAINING AND TECHNOLOGY TRANSFER

The Conference

Recalling Article 14, paragraph 1, which requires co-operation in the establishment of regional or subregional centers for training and technology transfer regarding the management of hazardous wastes and other wastes and the minimization of their generation, according to the specific needs of different regions and subregions,

Also recalling Article 14, paragraph 1, which stipulates that Parties shall decide on the establishment of appropriate funding mechanisms of a voluntary nature for the establishment of such regional or subregional centers,

Taking note of the interest expressed by a number of countries, in particular by Argentina, China, El Salvador, Jordan, Lebanon, Nigeria, Poland and Uruguay,

Also noting paragraph 28(a) of the report of the Technical Working Group (to prepare draft technical guidelines for the environmentally sound management of wastes subject to the Basel Convention - Geneva, 25-27 March 1992 - UNEP/CHW/WG.4/2/2) which referred to the urgent need to establish regional centres to ensure an early implementation of the Basel Convention in accordance with Article 14 of the Convention, and recommended to refer this issue to the First Meeting of the Conference of the Parties,

1. Decides that one of the functions of the Open-ended Ad Hoc Committee of the Conference will be to identify the specific needs of different regions and subregions for training and technology transfer;

2. Requests its Open-ended Ad Hoc Committee to consider these expressions of interest further and to report to the Second Meeting of the Conference of the Parties on ways and means for the

establishment and functioning of such centres, taking into consideration ongoing or future activities of regional centres or organizations/systems, as well as for the establishment of appropriate funding mechanisms of a voluntary nature for the establishment of such centres.

I/14. EMERGENCY FUND

The Conference

Recalling Article 14, paragraph 2, of the Basel Convention, which stipulates that "the Parties shall consider the establishment of a revolving fund to assist on an interim basis in case of emergency situations to minimize damage from accidents arising from the transboundary movements of hazardous wastes and other wastes or during the disposal of those wastes,"

Taking note of document UNEP/CHW.1/6, which includes the elements proposed by the Executive Director of UNEP for the establishment and functioning of such an emergency fund,

1. Requests the ad hoc working group of legal and technical experts established by decision I/5 to consider, having regard to document UNEP/CHW.1/6 and other relevant UNEP documents, the elements that would be required for establishing such an emergency fund, the relationship between such an emergency fund and the rules of procedures to be adopted in the field of liability and compensation, and the availability of institutions able to provide prompt and adequate assistance in emergency situations;

2. Further requests the ad hoc working group to present a progress report on its work to the Second Meeting of the Conference of the Parties, which includes an analysis of the likely impact of emergency situations of the size and nature of such emergency fund, taking into account the past emergency incidents and situations concerning transboundary movements of hazardous wastes and other wastes and their disposal.

I/15. ILLEGAL TRAFFIC IN HAZARDOUS WASTES

The Conference

Expressing its concern at the problem of illegal traffic in hazardous wastes, in particular to developing countries,

Conscious of the negative consequences of the illegal traffic on human health and the environment,

Convinced that the prevention of illegal traffic requires close co-operation among States, with the support of the Secretariat of the Basel Convention and all interested organizations,

1. Welcomes the United Nations Environment Programme (UNEP) and Economic and Social Commission for Asia and the Pacific (ESCAP) joint project currently being implemented on monitoring and assessment of illegal traffic in toxic and dangerous products and wastes in that region;

2. Requests the Secretariat to present an analytical report on the results of the UNEP-ESCAP joint project to the Second Meeting of the Conference of the Parties to the Basel Convention;

3. Also requests the Secretariat to co-operate with other regional commissions in order to achieve the goal of prevention of illegal traffic in hazardous wastes;

4. Urges the Parties to the Basel Convention that have not yet done so to promulgate laws that consider illegal traffic in hazardous wastes a criminal act;

5. Calls upon Parties in a position to do so to co-operate with the Secretariat to enable it to provide assistance to other Parties for the identification of cases of illegal traffic in accordance with Article 16, paragraph 1(i) of the Basel Convention;

6. Requests the Open-ended Ad Hoc Committee to study ways and means of enhancing the monitoring and prevention of illegal traffic in hazardous wastes and other wastes and to report its findings to the Conference of the Parties at its second meeting.

I/16. TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES DESTINED FOR RECOVERY OPERATIONS

The Conference

Noting paragraph 20.33 (c) of UNCED Agenda 21, Chapter 20, which calls upon countries "to promote the development of control procedures for the transboundary movements of hazardous wastes destined for recovery operations under the Basel Convention that encourage environmentally and economically sound recycling options,"

Aware of the difference of opinion with respect to the identification of and control procedures for hazardous wastes destined for recovery operations,

Requests its technical working group to review the issue and consider the views submitted by States and interested organizations, giving consideration to criteria that determine whether such wastes are suitable for recovery operations, to present its recommendations on guidelines, procedures or other matters within the framework of the Basel Convention to the Second Meeting of the Conference of the Parties for its consideration.

I/17. RESPONSIBILITY OF STATES FOR THE IMPLEMENTATION OF THE BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

The Conference

Recalling Resolution 4 of the Conference of Plenipotentiaries on the Basel Convention,

Having considered document UNEP/CHW.1/2 on the implementation of the resolutions adopted by the Conference of Plenipotentiaries on the Basel Convention,

Noting the replies provided by governments on institutional, legal and technical measures taken or intended to be taken,

1. Invites all States who have not done so to become Party to the Basel Convention;

2. Invites States Parties to the Convention to co-operate in developing cleaner production technologies and cleaner products which will lead to the reduction and, as far as practicable, the elimination of the generation of hazardous wastes;

3. Requests the Secretariat of the Basel Convention to facilitate co-operation between Parties to this effect.

I/18. COOPERATION BETWEEN THE INTERNATIONAL MARITIME ORGANIZATION AND THE UNITED NATIONS ENVIRONMENT PROGRAMME IN THE REVIEW OF EXISTING RULES, REGULATIONS AND PRACTICES WITH RESPECT TO TRANSPORT OF HAZARDOUS WASTES BY SEA

The Conference

Recalling Resolution 7 of the Conference of Plenipotentiaries on the Basel Convention,

Taking note of the activities undertaken by the Maritime Safety Committee and the Marine Environment Protection Committee of the International Maritime Organization (IMO) to review the relevant rules, regulations and practices with respect to the transport of hazardous wastes by sea in light of the Basel Convention,

1. Invites all Parties to the SOLAS and MARPOL Conventions which are not Party to the Basel Convention to become Party to this Convention;

2. Requests the Secretariat of the Basel Convention to co-operate further with IMO, and consult, as appropriate, with the United Nations Committee of Experts on the Transport of Dangerous Goods, as well as with other relevant international organizations, in the development of criteria for the definition of hazardous characteristics as referred to in Annex III to the Basel Convention;

3. Invites IMO, the Organization for Economic Co-operation and Development and other relevant international and regional organizations to take into consideration the notification and movement document provisionally adopted by the Conference in its Decision I/21 and to provide information to the Secretariat on the use and suggested revisions to such documents for consideration at the next meeting of the Conference of the Parties.

I/19. TECHNICAL GUIDELINES FOR THE ENVIRONMENTALLY SOUND MANAGEMENT OF WASTES SUBJECT TO THE BASEL CONVENTION

The Conference

Recalling Article 4 of the Basel Convention and Resolution 8 of the Conference of Plenipotentiaries on the Basel Convention,

Taking note of the terms of reference of the Open-ended Ad Hoc Committee of the Conference established under Decision I/2,

Having considered document UNEP/CHW.1/20 on technical guidelines for the environmentally sound management of wastes subject to the Convention,

1. Decides to accept the draft technical guidelines contained in document UNEP/CHW.1/20 as provisional technical guidelines forming the basis for the production of a formal document;

2. Invites all States and interested organizations to provide written comments on the provisional technical guidelines to the Secretariat of the Basel Convention with a view to their revision and distribution to States and interested organizations as soon as possible or, if necessary, consideration by the Technical Working Group;

3. Further invites all States and interested organizations to give particular attention in their comments to the subject areas listed in the annex to this decision;

4. Decides to extend the mandate of the Technical Working Group to review the revised provisional technical guidelines and to prepare technical guidelines for other priority operations and waste streams subject to the Basel Convention and submit the results of its work to the Open-ended Ad Hoc Committee;

5. Requests the Open-ended Ad Hoc Committee to consider and submit the technical guidelines

developed in paragraph 4 of this decision to the Second Meeting of the Conference of the Parties for adoption;

6. Invites States and interested organizations to co-operate in the preparation of the technical guidelines referred to in paragraph 4 above;

7. Also invites all States and interested organizations to use the technical guidelines referred to in paragraph 1 above as appropriate and report on their use to the Open-ended Ad Hoc Committee;

8. Requests the Secretariat of the Basel Convention and pending availability of funds, to facilitate the preparation and use of the technical guidelines referred to in paragraphs 1 and 4 respectively.

Annex to Decision I/19

Comments on the provisional Framework Document

1. Further consultation required on the future relevant priorities to be taken into account for the different waste management options and activities.

2. Future technical guidelines should address economic aspects of different proposed disposal and recovery operations as well as preventive measures.

(b) Comments on the provisional Technical Guidelines

The following issues were identified by several States and interest groups as deserving particular attention in comments to be provided on the provisional technical guidelines:

1. A regulatory and enforcement infrastructure is essential to ensure observance of the guidelines.

2. The vital role of the development and adoption of clean technologies must not be underplayed or downvalued. Guidelines should emphasize the importance of technology and environmental audits, rapid implementation of new approaches, substitution of technologies and raw materials, product life cycle analyses etc.

3. Waste management facilities of all sorts should be in the hands of technically competent, trained persons.

4. The principles set out in the draft guidelines provide a preliminary indication of available approaches to the management of waste. Options identified for waste streams require further consideration as to their long term suitability for environmentally sound management. For example, the appropriateness of options D3 and D5 for organic solvents, and the allowable level of PCB in waste oils.

5. Guidelines must never be regarded as providing a "once-and-for-all" indication of appropriate action and will require regular update in line with developing circumstances. Neither should they be regarded as prescriptive or a clear recommendation to use an option in all cases. They provide background information for guidance in decision making.

6. Transfer of technology, so as to make available the benefits of developments, must be encouraged.

7. Waste management activities of all types should be critically assessed as to their effectiveness and value by consideration of matters such as the input/output mass balance and the receiving environmental media.

8. In any consideration of technical guidelines notice must be taken of available capacity and the

capability to deal effectively with waste within the areas of each competent authority.

I/20. INTERNATIONAL COOPERATION: TRAINING AND SEMINARS RELATED TO THE BASEL CONVENTION

The Conference

Recalling Article 10, paragraph 1, of the Basel Convention,

Recalling further Resolution 4, paragraph 2, of the Conference of the Plenipotentiaries on the Basel Convention,

Taking note of the activities undertaken by UNEP, reflected in document UNEP/CHW.1/15 on international co-operation (Section I), to facilitate co-operation among Parties, to promote the environmentally sound management of wastes subject to the Basel Convention and to promote public awareness,

1. Requests the Secretariat of the Basel Convention and, as appropriate, in co-operation, with other units in UNEP and other relevant international organizations, to organize national and regional seminars or workshops and training programmes on the implementation of the Basel Convention and the environmentally sound management of wastes and hazardous wastes; and to help promote the adoption of cleaner production methods and new low-waste technologies;

2. Invites Parties to contribute technically and financially towards the organization of seminars, workshops and training programme and towards covering the cost of participation of developing country representatives.

1/21. DOCUMENTATION: NOTIFICATION, MOVEMENT DOCUMENT

The Conference

Recalling Article 4, paragraphs 2(f) and 7(c), Article 16, paragraph 1(g), and Annexes V A and V B to the Basel Convention,

Taking note of the draft forms for both the notification and movement documents prepared by the Secretariat of the Basel Convention,

1. Adopts provisionally the proposed notification and movement documents contained in document UNEP/CHW.1/12;

2. Recommends that the Parties to the Basel Convention use the proposed notification and movement documents and the forms in document UNEP/CHW.1/12 when consenting to or rejecting a proposed transboundary movement of hazardous wastes;

3. Encourages Parties to provide information to the Secretariat on the use of documents and to consider appropriate provisions at the next meeting of the Conference of the Parties.

I/22

The Conference

Recalling the aims of the Basel Convention to reduce to a minimum the generation of hazardous wastes and other wastes, to ensure that whatever is produced is disposed of in an environmentally sound

and efficient manner as close to the point of generation as possible, and to prevent the transboundary movement of such wastes if there is reason to believe that the wastes in question will not be managed in an environmentally sound manner,

Further recalling that, in the interest of protecting human health and the environment, the fourth ACP/EEC Convention of 15 December 1989 (Lomé IV) and the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements of Hazardous Wastes within Africa of 30 January 1991, both of which prohibit transboundary movement of hazardous wastes to developing countries, and the former which required ACP States to prohibit the direct or indirect import of hazardous wastes into their territory from the European Community or from any other country,

Conscious that during the negotiations leading to the United Nations Conference on Environment and Development (UNCED), developing countries called for the prohibition of hazardous waste shipments from industrialized to developing countries,

Recalling decision I/16 regarding the transboundary movements of hazardous wastes destined for recovery operations,

Reaffirming the obligations of all Parties, including industrialized countries, as provided for in the Convention, to prohibit the export of hazardous wastes and other wastes to Parties which have prohibited their import and to non-Parties,

1. Requests the industrialized countries to prohibit transboundary movements of hazardous wastes and other wastes for disposal to developing countries without prejudice to paragraph 2;

2. Notes that until the Conference of the Parties receives and acts upon the report of the Technical Working Group referred to in Decision I/16 and until appropriate measures are taken pursuant to paragraph 7 of Article 15, transboundary movements of hazardous and other wastes destined for recovery and recycling operations take place in accordance with the provisions of the Convention and in particular the requirement that the waste be handled in an environmentally sound manner;

3. Requests industrialized countries to inform the Secretariat of the Basel Convention of the measures undertaken in order to implement paragraph 1;

4. Further requests developing countries to prohibit the import of hazardous wastes from industrialized countries;

5. Also requests developing countries to inform the Secretariat of the Basel Convention of the measures undertaken in order to implement paragraph 4;

6. Requests the Secretariat of the Basel Convention to report to the Second Meeting of the Conference of the Parties on the information received pursuant to paragraphs 3 and 5 above.

I/23. THE ROLE OF THE SECRETARIAT OF THE BASEL CONVENTION IN THE IMPLEMENTATION OF AGENDA 21

The Conference

Recalling Agenda 21 adopted by UNCED in June 1992, aware of the fact that a number of the activities mentioned in Chapters 20 and 21 of Agenda 21 are either on-going or initiated under the Basel Convention,

Having considered document UNEP/CHW.1/7/Add.1,

1. Invites the Parties to the Convention to co-operate with each other directly or through the

Secretariat of the Basel Convention in the implementation of activities related to the Basel Convention contained in Chapters 20 and 21 of Agenda 21;

2. Calls on the Basel Convention Secretariat, in co-operation with other relevant units in UNEP, as well as with other relevant organs and organizations of the United Nations system, to carry out, as a priority and within available resources, the activities listed in paragraph 3 of document UNEP/CHW.1/7/Add.1.

DECISIONS ADOPTED BY THE SECOND MEETING OF THE CONFERENCE OF THE PARTIES

in Geneva, Switzerland
on 25 March 1994

II/1. LIABILITY AND COMPENSATION

The Conference

Recalling Decision I/5 of the First Meeting of the Conference of the Parties to the Basel Convention establishing an ad hoc working group of legal and technical experts to consider and develop a draft protocol on liability and compensation, possibly including the establishment of an International Fund for compensation for damage resulting from the transboundary movements of hazardous wastes and their disposal,

Having considered the report of the Ad Hoc Working Group, attached to the note of the Secretariat contained in document UNEP/CHW.2/3,

1. Decides to extend the mandate of the Ad Hoc Working Group;

2. Notes with appreciation the progress report presented to it by the Ad Hoc Working Group of Legal and Technical Experts to consider and develop a draft protocol on liability and compensation for damage resulting from transboundary movements of hazardous wastes and their disposal;

3. Requests the Secretariat of the Basel Convention to address the questionnaire requiring information on the factual basis concerning liability and compensation to States Parties and non-Parties to the Basel Convention and to present a report on this subject to the next meeting of the Ad Hoc Working Group;

4. Requests States to respond to the Secretariat questionnaire as soon as possible;

5. Requests the Ad Hoc Working Group to make all efforts to finalize the proposed draft Articles of the Protocol in order to present it for consideration and possible adoption by the Third Meeting of the Conference of the Parties to the Basel Convention.

II/2. EMERGENCY FUND

The Conference

Recalling Article 14, paragraph 2, of the Basel Convention, which stipulates that "the Parties shall consider the establishment of a revolving fund to assist on an interim basis in case of emergency

situations to minimize damage from accidents arising from the transboundary movements of hazardous wastes and other wastes or during the disposal of those wastes,"

Further recalling Decision I/14 of the First Meeting of the Conference of the Parties to the Basel Convention which requested the Ad Hoc Working Group of Legal and Technical Experts established by Decision I/5 to consider the elements that would be required for establishing such an emergency fund, the relationship between such an emergency fund and the rules of procedures to be adopted in the field of liability and compensation, and the availability of institutions able to provide prompt and adequate assistance in emergency situations,

Having considered the related parts of the report of the Ad Hoc Working Group of Legal and Technical Experts in relation to the implementation of Decision I/14 of the First Meeting of the Conference of the Parties on "Emergency Fund" as well as the note of the Secretariat contained in document UNEP/CHW.2/4,

1. Requests the Ad Hoc Working Group of Legal and Technical Experts to continue the consideration of the elements that would be required for establishing an emergency fund, and the relationship between such an emergency fund and the Protocol on Liability and Compensation under consideration by the same group;

2. Further requests the Ad Hoc Working Group to present a progress report on its work to the third meeting of the Conference of the Parties.

II/3. MECHANISM FOR THE IMPLEMENTATION OF THE BASEL CONVENTION

The Conference

Recalling Decision I/2 of the First Meeting of the Conference of the Parties to the Convention by which it has established the Open-ended Ad Hoc Committee,

1. Welcomes the work of the Open-Ended Ad Hoc Committee and request it to meet as necessary between the meetings of the Conference of the Parties in order to fulfil the task placed on it by the Conference of the Parties, subject to available resources;

2. Requests the Open-Ended Ad Hoc Committee to fulfil the task placed on it by decisions II/5, II/10, II/11, II/12, II/14, II/16, II/17, II/18, II/19, II/22, II/26 and II/27 and present a report on its work to the third meeting of the Conference of the Parties;

3. Requests the Secretariat of the Basel Convention to convene the Open-Ended Ad Hoc Committee and any subgroups the Committee needs to establish to facilitate its work, subject to available resources.

II/4. ILLEGAL TRAFFIC IN HAZARDOUS WASTES AND OTHER WASTES

The Conference

Expressing its concern at the problems of illegal traffic in hazardous wastes and other wastes, in particular to developing countries and to the countries in transition,

Recalling Decision I/15 of the First Meeting of the Conference of the Parties,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/8,

Having further considered the Open-ended Ad Hoc Committee recommendations contained in its Decision I/6 on "Illegal Traffic in Hazardous Wastes and other Wastes,"

1. Requests the Parties to promulgate or develop stringent national legislation on the control of transboundary movements of hazardous wastes taking into account the elements contained in document UNEP/CHW/C.1/1/7;

2. Further requests the Parties to incorporate in their legal systems, appropriate sanctions or penalties for the illegal traffic in hazardous wastes and other wastes;

3. Requests the regional commissions and secretariats of regional conventions and protocols to take an effective role in the monitoring and prevention of illegal traffic in hazardous wastes and other wastes and to coordinate their efforts and activities in this regard with the Secretariat of the Basel Convention;

4. Requests all governments to promote the interministerial coordination within the respective government to prevent and penalize illegal traffic in hazardous wastes and other wastes;

5. Requests the Secretariat of the Basel Convention to:

(a) Assist Parties in developing national legislation to deal with illegal traffic and hazardous wastes and other wastes;

(b) Assist Parties in capacity-building including the development of an appropriate infrastructure with a view of the prevention and penalization of illegal traffic in hazardous wastes and other wastes and to ensure the involvement of national authorities and focal points for the Basel Convention in the prevention and monitoring of illegal traffic in hazardous wastes and other wastes;

(c) Liaise with the various regional commissions and secretariats of regional conventions and protocols with a view to promoting the development of compatible regional mechanisms and systems;

(d) Promote the implementation of the appropriate parts of chapter 20 of Agenda 21 related to the illegal traffic in hazardous wastes, in particular its section D. In this regard a report should be presented to the relevant substantive session of the United Nations Commission on Sustainable Development;

(e) Continue its cooperation with the Customs Co-operation Council Secretariat with a view to ensure better control of import and export of hazardous wastes and other wastes and in particular to identify hazardous wastes and other wastes subjected to the Basel Convention in the Harmonized System;

(f) Include, in cooperation with the governments concerned, the Customs Co-operation Council and the International Maritime Organization, the training of customs and ports officers in relation to the import and export of hazardous wastes and other wastes in its programme of training activities;

(g) Receive, collate and disseminate information on illegal traffic in hazardous wastes and other wastes promptly and systematically with a view to ensuring that hazardous waste detected and rejected by one country is not dumped in another;

(h) Explore the possibility of cooperation with Interpol in cases of illegal traffic in hazardous wastes and other wastes;

(i) Establish a well-defined reporting system on cases of illegal traffic in hazardous wastes and other wastes, which would:

(i) Request Parties to report to the Secretariat on any cases of illegal traffic in hazardous wastes and

other wastes as defined by the Basel Convention and the actions taken to monitor and prevent such cases, and

(ii) Include a submission by the Secretariat to the Conference of the Parties to the Basel Convention of reports, based on information received from the Parties, on cases of illegal traffic in hazardous wastes and other wastes and the publication of these reports;

(iii) Enhance its cooperation in the prevention and monitoring of illegal traffic in hazardous wastes and other wastes with non-governmental organizations, industry and the private sector;

(iv) Submit a report on the above-mentioned activities to the third meeting of the Conference of the Parties to the Basel Convention.

II/5. MODEL NATIONAL LEGISLATION FOR THE TRANSBOUNDARY MOVEMENT AND MANAGEMENT OF HAZARDOUS WASTES

The Conference

Recalling paragraph 4 of Article 4 of the Basel Convention which requests the Parties to take appropriate legal, administrative and other measures to implement and enforce the provisions of the Convention,

Convinced that an essential element of the fulfilment by the Parties of their obligations under the Convention is to promulgate new or adapt existing laws and regulations in accordance with the provisions of the Basel Convention,

Aware of the need of States to be assisted - upon request - in the formulation of their law and the development of institutional arrangements in the field of hazardous wastes, in particular in the implementation of the Basel Convention,

1. Accepts as a possible guideline the revised draft model national legislation annexed to the report of the Secretariat contained in document UNEP/CHW.2/5;

2. Requests the Secretariat to make available as a possible guideline the revised draft model national legislation to Parties as well as to non-Parties;

3. Also requests the Secretariat, in providing technical assistance in the field of national legislation, to take into account, *inter alia*, the revised draft model national legislation;

4. Invites Parties and non-Parties to communicate to the Secretariat their comments on the revised draft model national legislation;

5. Further requests the Secretariat to update, as necessary, the revised draft model national legislation and to report to the Open-ended Ad Hoc Committee for the implementation of the Convention.

II/6. DESIGNATION OF COMPETENT AUTHORITIES AND FOCAL POINTS

The Conference

Recalling Article 5 which requires the Parties to designate or establish one or more competent authorities and one focal point and to inform the Secretariat of the Basel Convention within three months of the date of the entry into force of the Convention for them, of the agencies they have designated as their competent authorities and focal point,

Also recalling Decision I/10 of the First Meeting of the Conference of the Parties,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/17,

Invites Parties which have not yet informed the Secretariat of the designation of their competent authorities and focal points to do so as soon as possible.

II/7. RELATIONSHIP OF THE BASEL CONVENTION AND THE LONDON CONVENTION, 1972

The Conference

Recalling Decision I/4 of the First Meeting of the Conference of the Parties related to the harmonization of the Basel Convention and London Convention, 1972 and the cooperation between the Secretariat of the both Conventions in order to achieve this aim,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/23,

1. Welcomes the response of the Contracting Parties to the London Convention, 1972 to the request made to them by decision I/4 of the First Meeting of the Conference of the Parties to the Basel Convention;

2. Invites the remaining Parties to the London Convention, 1972 who are not Parties to the Basel Convention to become Parties in order to facilitate the coordination and harmonization of the two Conventions;

3. Welcomes the decision by the 16th Consultative Meeting of the London Convention, 1972 to prohibit the dumping of industrial wastes and radioactive wastes and other radioactive matter at sea, as well the incineration at sea of industrial and sewage sludge;

4. Requests the Secretariat of the Basel Convention to continue its cooperation with the London Convention, 1972 in the preparatory process for the amendment of the London Convention, 1972 in order to achieve the goal of harmonization of the two Conventions and to report to the third meeting of the Conference of the Parties to the Basel Convention.

II/8. COOPERATION WITH THE INTERNATIONAL ATOMIC ENERGY AGENCY

The Conference

Recalling Decision I/6 of the First Meeting of the Conference of the Parties on the harmonization of the procedure of the Basel Convention and the Code of Practice on the international transboundary movements of radioactive waste,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/25,

1. Welcomes the adoption of the Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes in Flasks on Board Ships;

2. Requests the Secretariat of the Basel Convention to continue its cooperation with the International Atomic Energy Agency (IAEA) and the International Maritime Organization in relation to the implementation of the Code;

3. Further requests the Secretariat to continue its cooperation with the IAEA for the implementation

of IAEA's General Conference Resolution GC(XXXVII)/Res/615, dated October 1993, which requested the Director General to initiate preparations for a convention on the safety of waste management as soon as the on-going process of developing waste management safety fundamentals has resulted in broad international agreement.

II/9. FOLLOW-UP TO UNEP GOVERNING COUNCIL DECISIONS 17/5, 17/13 AND 17/18

The Conference

Recalling the Decisions adopted by the Governing Council of UNEP at its seventeenth session in May 1993 on:

* Application of environmental norms by military establishments (17/5)

* Carriage of irradiated nuclear fuel by sea (17/13)

* Environmentally sound management of hazardous wastes (17/18)

Having considered the report by the Secretariat on the follow-up to the UNEP Governing Council Decisions 17/5, 17/13 and 17/18 contained in document UNEP/CHW.2/29,

1. Take note of the fact that the Secretariat of the Basel Convention has been given the responsibility, in cooperation with other units of UNEP, to work on matters closely related to the Basel Convention through the implementation of the Governing Council Decisions 17/5, 17/13 and 17/18;

2. Appreciate that the part of the work undertaken by the Secretariat of the Basel Convention to implement the Governing Council Decision 17/5, 17/13 and 17/18 which are not part of the work programme adopted by the First Meeting of the Conference of the Parties of the Basel Convention has been supported financially from funds from UNEP.

II/10. BILATERAL, MULTILATERAL AND REGIONAL AGREEMENTS OR ARRANGEMENTS

The Conference

Recalling that Article 11, paragraph 1, of the Basel Convention permits Parties to enter into bilateral, multilateral and regional agreements or arrangements regarding the transboundary movements of hazardous wastes or other wastes with Parties and non-Parties provided that such agreements or arrangements do not derogate from the environmentally sound management of hazardous wastes and other wastes as required by the Basel Convention and that these agreements or arrangements shall stipulate provisions which are not less environmentally sound than those provided for by the Convention, in particular taking into account the interest of developing countries,

Recalling that Article 11, paragraph 2, provides that the provisions of the Basel Convention shall not affect transboundary movements which are taking place pursuant to agreements concluded prior to the entry into force of the Basel Convention for the relevant Parties of such agreements provided that such agreements are compatible with the environmentally sound management of hazardous wastes and other wastes as required by the Basel Convention,

Recalling Decision I/9 of the First Meeting of the Conference of the Parties,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/9 on the implementation of Decision I/9 referred to above,

Requests Parties which have entered, in accordance with Article 11, into bilateral, multilateral and regional agreements or arrangements to report, consistent with national laws and regulations, to the Open-Ended Ad Hoc Committee, through the Secretariat of the Basel Convention, on the conformity of such agreements or arrangements taking into consideration the list of questions annexed to this decision.

Annex

Questions to be considered by Parties to
Bilateral, Multilateral or Regional Agreements or
Arrangements when reporting on their conformity
with the provisions of Article 11 of the Convention

In preparation of its report to the Conference of the Parties, the following questions could be used as guidance by a Party when it is reviewing one of its agreements which falls under Article 11. The questions would help the Party focus on particular issues, however it is important to note that the agreement must be viewed in its entirely and not strictly provision by provision. It is also recognized that the purpose of the said agreement and the geographic, legal and economic circumstances of the other Contracting Party(ies) constitute elements of this review. A Party's Report would have to indicate that the different requirements found in paragraph 1 or 2 of Article 11, as appropriate, are met in conformity with the Basel Convention.

1. Does the Agreement address the control of the transboundary movement of hazardous wastes and other wastes subject to the Basel Convention?

2. Taking all practicable steps, will the management of hazardous wastes under the Agreement or arrangement be such that it will protect human health and the environment against adverse effects?

3. How does the Agreement or arrangement take into account the interests of developing countries?

4. Does the Agreement or arrangement require prior notification?

5. Does the Agreement or arrangement require prior consent?

6. Does the Agreement or arrangement provide for the tracking of the wastes?

7. Does the Agreement or arrangement provide for alternate measures for wastes which cannot be managed as planned?

8. Does the Agreement or arrangement provide for the identification of authorities responsible for the implementation of such an Agreement?

9. Are the obligations of the Article 11 Agreement or arrangement consistent with the control measures related to transboundary movements of hazardous wastes as provided for by the Basel Convention?

10. Are the wastes covered by the Article 11 Agreement and arrangement consistent with the scope of the Basel Convention?

II/11. SCOPE OF THE CONVENTION

The Conference

Having considered the issue of the scope of the Basel Convention in relation to its applicability to radioactive waste as raised by the Secretariat in document UNEP/CHW.2/26,

1. Invites Parties and non-Parties to present their views on this issue to the Secretariat of the Basel Convention;

2. Requests the Secretariat on the basis of these views in collaboration with the IAEA to prepare a document for further consideration by the Meeting of the Open-ended Ad Hoc Committee for the Implementation of the Convention.

II/12

The Conference

Recalling the request of the G-77 countries at the First Meeting of the Conference of the Parties to the Basel Convention in Uruguay, 30 November - 4 December 1992, for the total ban on all exports of hazardous wastes from OECD countries to non-OECD countries,

Recognizing that transboundary movements of hazardous wastes from OECD to non-OECD States have a high risk of not constituting an environmentally sound management of hazardous wastes as required by the Basel Convention,

1. Decides to prohibit immediately all transboundary movements of hazardous wastes which are destined for final disposal from OECD to non-OECD States;

2. Decides also to phase out by 31 December 1997, and prohibit as of that date, all transboundary movements of hazardous wastes which are destined for recycling or recovery operations from OECD to non-OECD States;

3. Decides further that any non-OECD State, not possessing a national hazardous wastes import ban and which allows the import from OECD States of hazardous wastes for recycling or recovery operation until 31 December 1997, should inform the Secretariat of the Basel Convention that it would allow the import from an OECD State of hazardous wastes for recycling or recovery operations by specifying the categories of hazardous wastes which are acceptable for import; the quantities to be imported; the specific recycling/recovery process to be used; and the final destination/disposal of the residues which are derived from recycling/recovery operations;

4. Requests the Parties to report regularly to the Secretariat on the implementation of this decision, including details of the transboundary movements of hazardous wastes allowed under paragraph 3 above. Further requests the Secretariat to prepare a summary and to compile these reports for consideration by the Open-ended Ad Hoc Committee. After considering these reports, the Open-ended Ad Hoc Committee will submit a report based on the input provided by the Secretariat to the Conference of the Parties of the Convention;

5. Requests further the Parties to cooperate and work actively to ensure the effective implementation of this decision.

II/13. TECHNICAL GUIDELINES FOR THE ENVIRONMENTALLY SOUND MANAGEMENT OF WASTES SUBJECT TO THE BASEL CONVENTION

The Conference

Recalling Decision I/19 of the First Meeting of the Conference of the Parties to the Basel Convention accepting the Framework Document on the Preparation of Technical Guidelines and the four Technical Guidelines on priority waste streams and extending the mandate of the Technical

Working Group to review the revised three Draft Technical Guidelines on Disposal Operations and to prepare Technical Guidelines for other priority operations and wastes streams subject to the Basel Convention,

Further recalling the Decision I/7 of the Open-ended Ad Hoc Committee on Technical Guidelines for the Environmentally Sound Management of Wastes subject to the Basel Convention recommending that the Conference of the Parties adopts the three draft Technical Guidelines on Disposal Operations (Specially Engineered Landfill D5; Incineration on Land D10; Used Oil Re-refining or other Re-uses of Previously Used Oil R9) and extend the mandate of the Technical Working Group with the aim to continue the preparation of new technical guidelines as identified by the Group itself, namely on:

(I) First priority: D9 Physico-chemical treatment; R4 Recycling/reclamation of metals and metal compounds; Y17 Wastes resulting from surface treatment of metals and plastics;

(II) Second priority: Y1 Clinical wastes; D8 Biological treatment; R1 Use as fuel; R2 Solvent reclamation/regeneration.

Having considered the report of the Secretariat on the Implementation of Decision I/19 which contains the Framework Document and the four Technical Guidelines on Priority Waste Streams (document UNEP/CHW.2./10) and the three Technical Guidelines on Priority Disposal Operations (document UNEP/CHW.2/10/Add. 1),

Noting with appreciation the progress achieved by the Technical Working Group in the preparation of the Framework Document and the Technical Guidelines for Priority Waste Streams and Disposal Operations subject to the Basel Convention,

1. Confirms adoption of the Framework Document on the Preparation of Technical Guidelines for the Environmentally Sound Management of Wastes Subject to the Basel Convention and the four sets Technical Guidelines, namely on Hazardous Wastes from the Production and Use of Organic Solvents (Y6), on Waste Oils from Petroleum Origins and Sources (Y8), on Wastes Comprising or Containing PCBs, PCTs and PBBs (Y10), and on Waste Collected from Household (Y46); and requests the Secretariat to publish and disseminate the Framework Document and the four Technical Guidelines between Parties and non-Parties together with a cover note explaining the nature of the document;

2. Adopts provisionally the three draft Technical Guidelines on: Specially Engineered Landfill (D5), on Incineration on Land (D10) and Used Oil Re-refining or other Re-uses of Previously Used Oil, subject to the additional comments to be provided to the Secretariat by States and concerned international organizations, and to publish and disseminate them to Parties and non-Parties;

3. Extends the mandate of the Technical Working Group with the aim for this Group to: further revise as appropriate the Draft Technical Guidelines adopted provisionally and to continue the preparation of new technical guidelines as identified by the Technical Working Group, namely on:

First priority

- D9 Physico-chemical treatment
- R4 Recycling/reclamation of metals and metals compounds
- Y17 Wastes resulting from surface treatment of metals and plastics

Second priority

- Y1 Clinical wastes
- D8 Biological treatment
- R1 Use as a fuel
- R2 Solvent reclamation/regeneration

The Conference

Recalling decision I/16 of the First Meeting of the Conference of the Parties to the Basel Convention requesting its Technical Working Group to review the issue and consider the views submitted by States and interested organizations and to present its recommendations to the Parties at their second meeting,

Noting paragraph 20.33 (c) of UNCED Agenda 21, chapter 20, which calls upon countries "to promote the development of control procedures for the transboundary movements of hazardous wastes destined for recovery operations under the Basel Convention that encourage environmentally and economically sound recyclable options,"

Also recalling decision I/7 of the Open-ended Ad Hoc Committee recommending to the Conference to extend the mandate of the Technical Working Group to further develop the draft paper on transboundary movements of hazardous wastes destined for recovery operations, and to invite interested Parties and non-Parties, and as the case may be non-governmental organizations and/or the private sector to prepare, in association with the Secretariat of the Basel Convention, two or three case-studies related to recovery operations involving two countries in full respect of the environmentally sound management of hazardous wastes destined to such recovery operations,

Having considered the draft paper on transboundary movements of hazardous wastes destined for recovery operations annexed to the note of the Secretariat (UNEP/CHW.2/12),

1. Welcomes the draft paper on transboundary movements of hazardous wastes destined for recovery operations;

2. Decides to extend the mandate of the Technical Working Group to further develop this draft paper on transboundary movements of hazardous wastes destined for recovery operations, taking into account the comments formulated by States and interested organizations and to present a revised version of this document to the Third Meeting of the Conference of the Parties for adoption in consultation with the Open-ended Ad Hoc Committee;

3. Requests Parties together with non-Parties, and as the case may be non-governmental organizations, including the private sector to prepare, in association with the Secretariat of the Basel Convention, two or three case studies along the lines developed in the terms of reference annexed to this Decision, related to recovery operations involving two countries in full respect of the environmentally sound management of the hazardous wastes destined to such recovery operations;

4. Further requests the Technical Working Group to develop guidance to assist States on the question of hazardous wastes under the Basel Convention, including hazardous wastes destined for recovery operations and in co-operation with the Open-ended Ad Hoc Committee to present such guidance to the Third Meeting of the Conference of the Parties for consideration.

Annex

Proposed Terms of Reference for the Case-Studies on
the Environmentally Sound Management of
Hazardous Wastes destined for Recovery Operations

(a) Identify the hazardous waste streams that are subject to recovery operations and the national/domestic infrastructure including legal and administrative arrangements that sustain such operations.

(b) Describe the existing trade in wastes identified and the structure and characteristics of the industries involved.

(c) Identify the technological options for the management of these wastes including their economic and technical aspects.

(d) Carry out a practical assessment of these facilities which recover the hazardous wastes, how the residues arising from the process are being disposed of and their impact on the health and the environment.

(e) Compare environmental and economic aspects of the recovery of secondary raw material from hazardous wastes and the production from virgin materials taking into account the disposal of any residues generated through the process.

II/15. POSSIBLE EFFECTS OF THE BASEL CONVENTION ON THE TRANSBOUNDARY MOVEMENTS OF WASTE OZONE-DEPLETING CHEMICALS, INCLUDING HALONS, INTENDED FOR RECOVERY

The Conference

Recalling Article 1 of the Basel Convention concerning the scope of the Convention, in particular its paragraph 1 (a),

Having considered the report by the Secretariat on possible effects of the Basel convention on the transboundary movements of waste ozone-depleting chemicals, including halons, intended for recovery contained in document UNEP/CHW.2/11,

Also noting the consideration of the Technical Working Group in regard to its role in the case of a need for technical interpretation of the Convention,

1. Requests its Technical Working Group in close cooperation with the Ozone Secretariat to further work on the issue of the classification of the waste ozone-depleting chemicals as hazardous wastes in accordance with the Basel Convention definition;

2. Also requests its Technical Working Group to perform the functions of its advisory body in case of a need for technical interpretation of the Convention;

3. Further requests its Technical Working Group to report on the issue of waste ozone-depleting chemicals and any cases involving a technical interpretation of the Convention to the Third Meeting of the Conference of the Parties.

II/16. DOCUMENTATION: NOTIFICATION, MOVEMENT DOCUMENT

The Conference

Recalling Decision I/21 of the First Meeting of the Conference of the Parties to the Basel Convention adopting, provisionally, the forms for both the Notification and the Movement Document and recommending to Parties to use these forms,

Noting that some delegations to the Open-ended Ad Hoc Committee emphasized the need to harmonize the forms of the Basel Convention with related forms being developed by the OECD and the EU (Paragraph 16 of the Report of the First Meeting of the Open-ended Ad Hoc Committee for the implementation of the Basel Convention),

Having considered the report of the Secretariat contained in document UNEP/CHW.2/14,

1. Requests the Parties to continue using the forms adopted provisionally and to inform the Secretariat on their experience on the use of these forms;

2. Requests the Secretariat to continue its work on the format of the Notification and Movement Document based on the replies received and comments to be sent by the Parties and international organizations concerned to the Secretariat by June 1994;

3. Instructs the Secretariat to report on paragraphs (1) and (2) above to the Third Meeting of the Conference of the Parties in consultation with the Open-ended Ad Hoc Committee, and to present its recommendations for any changes to be made to the Notification and Movement Document.

II/17. TRANSMISSION OF INFORMATION

The Conference

Recalling Article 13 of the Basel Convention which stipulates that the Parties to the Convention shall, through the Secretariat, provide information to each other and in some cases also to non-Party States on a set of issues concerning transboundary movements of hazardous wastes and their disposal,

Further recalling Decision I/11 of the First Meeting of the Conference of the Parties which requested the Secretariat to prepare an analytical summary of the reports submitted to it and to present the summary to its Open-ended Ad Hoc Committee for evaluation of the information contained therein and a report on their findings to the Conference of the Parties at its Second Meeting,

Having considered the information provided by the Parties of the Convention presented in documents UNEP/CHW/C.1/1/5 and UNEP/CHW.2/15 (ref. also the compiled information provided in documents UNEP/CHW/C.1/1/Inf. 3 and UNEP/CHW.2/Inf. 5) and Decision I/4 of the Open-ended Ad Hoc Committee,

1. Urges Parties to report, as soon as possible, to the Secretariat in accordance with Article 13, on activities undertaken in 1993, using the form provided by the Secretariat for this purpose;

2. Also urges those Parties who have already presented an interim report for 1993 to provide any complementary information, as necessary, well in time, in order to enable the Secretariat to prepare a comprehensive analytical summary of the information provided by the Parties for the whole of 1993 to be considered by the next meeting of the Open-ended Ad Hoc Committee for the Implementation of the Basel Convention;

3. Further requests the Secretariat to issue in one document all information received up to date and presented in various documents and distributed to Parties, non Parties and non governmental organizations.

II/18. ESTABLISHMENT OF THE INFORMATION MANAGEMENT SYSTEM OF THE BASEL CONVENTION IN ACCORDANCE WITH THE DECISION I/4 OF THE FIRST MEETING OF THE OPEN-ENDED AD HOC COMMITTEE FOR THE IMPLEMENTATION OF THE BASEL CONVENTION

The Conference

Recalling Decision I/4 of the First Meeting of the Open-ended Ad Hoc Committee inviting the Conference to consider the need to develop an electronic information system and integrated telecommunications network to improve data gathering, organization, treatment and dissemination, and

to provide assistance to developing countries in the collection and processing of these databases on a detailed request by the Secretariat that includes relevant technical and financial requirements,

Having considered the report by the Secretariat on the establishment of the Information Management System of the Basel Convention contained in document UNEP/CHW.2/16,

1. Requests the Secretariat of the Basel Convention to develop the Information Management System of the Basel Convention based on the outcome of the preliminary review, and to report on progress to the Third Meeting of the Conference of the Parties in consultation with the Open-ended Ad Hoc Committee;

2. Requests the Parties to allocate adequate financial resources for a minimum period of two years (1994-95), taking into account the costs estimated as indicated under paragraph 9, to allow the Secretariat to develop the Information Management System;

3. Also requests the Parties to make additional contribution for the budget for 1994 to allow starting of the establishment of the information management system already in 1994 subject to availability of resources.

II/19. ESTABLISHMENT OF REGIONAL CENTRES FOR TRAINING AND TECHNOLOGY TRANSFER

The Conference

Recalling Decision I/13 on the Establishment of Regional Centres for Training and Technology Transfer of the First Meeting of the Conference of the Parties to the Basel Convention in which it was decided that one of the functions of the Open-ended Ad Hoc Committee of the Conference would be to identify the specific needs of different regions and subregions for training and technology transfer and to report to the Second Meeting of the Conference of the Parties on ways and means for the establishment and functioning of such Centres, including considering appropriate funding mechanisms for this purpose,

Having considered the note of the Secretariat contained in document UNEP/CHW.2/19,

Having further considered the Open-ended Ad Hoc Committee recommendations contained in its Decision I/5 on "Establishment of Regional Centres for Training and Technology Transfer (annexed)",

Requests the Conference of the Parties to provide a strong mandate for the Open-ended Ad Hoc Committee at its second meeting, as already proposed in Committee Decision I/5, to conclude the selection of sites for the establishment of regional centre(s) based on the results of the feasibility studies and taking into account the existence of any related regional centre and inform the Third Meeting of the Conference of the Parties of the decision taken to enable the initiation of activities for the establishment of the regional centre(s).

Annex

Committee Decision I/5 on Establishment of Regional Centres for Training and Technology Transfer

The Open-ended Ad Hoc Committee

Recalling Decision I/13 on Establishment of Regional Centres for Training and Technology Transfer adopted by the Parties at their first meeting,

Also recalling Agenda 21 adopted by UNCED in June 1992 regarding the establishment of regional centres for training and technology transfer as outlined in paras 20.28(d) and 20.31(e) of Chapter 20 of Agenda 21,

Having considered the report by the Secretariat (UNEP/CHW/C.1/1/6 of 18 August 1993) on information received from the interested Parties to the Basel Convention in relation to the Establishment of Regional Centres for Training and Technology Transfer,

Convinced that States should cooperate to ensure the environmentally sound management of hazardous wastes and the minimization of their generation, according to the specific needs of different regions and sub-regions,

Recognizing that cooperation in the establishment of regional or subregional centres for training and technology transfer will facilitate the environmentally sound management of hazardous wastes and minimization of their generation,

Recommends that the following guidelines be used as a basis to determine the suitability of a potential pilot centre(s):

(a) Presence or potential use of an existing suitable facility, e.g. technology centre, university;

(b) Having access to appropriately-qualified individuals suitable for a hazardous waste management training programme and who can act as future instructors or trainers;

(c) Availability of a personnel pool to implement a hazardous waste management system;

(d) Commitment to invest time and resources into the maintenance, continuation and advancement of the centre;

(e) Programme must be fully recognized and promoted by senior government authorities;

(f) Centres should be located in a reasonably accessible area within a candidate region.

Invites those countries in a position to do so, individually or collectively, on a bilateral or multilateral basis, to consider supplying financial resources and technically qualified person(s) recruited from either government or the private sector to collaborate in the preparation of the feasibility study(ies) in the candidate regions,

Each feasibility study should include:

(a) Identifying and prioritizing the needs of the region;

(b) Identifying the resources available in the region;

(c) Identifying the resources required to address the needs;

(d) Identifying the benefits to be gained through establishment of a pilot centre;

(e) Obtaining views from candidate regions as to the types of technical assistance or training they consider to be of the highest priority;

(f) Determining if a centre is immediately required to address the prioritized needs;

(g) Determining what resources are available from each candidate region and what resources would be required.

Invites the Secretariat of the Basel Convention to take the necessary steps for the preparation of feasibility studies in Africa, Asia and the Pacific, Latin America and the Caribbean and Eastern Europe. This may involve acting as a liaison with individual host countries to provide for local support for the person(s) conducting the feasibility study. The candidate region should also provide, as appropriate, qualified person(s) to assist the technical representative in conducting the feasibility study,

Requests the Secretariat to prepare a report, based on a review of the feasibility studies, for distribution to all Parties and Signatories,

Requests the second meeting of the Conference of the Parties, based on the completion of the feasibility studies, to select sites for the establishment of regional centre(s). In case this is not possible, requests the Conference of the Parties to provide the mandate to the Open-ended Ad Hoc Committee to conclude the selection and inform the third meeting of the Conference of the Parties of the decision taken to initiate activities for the establishment of the regional centre(s).

II/20. TRAINING AND SEMINARS RELATED TO THE BASEL CONVENTION

The Conference

Recalling Decision I/20 adopted by the First Meeting of the Conference of the Parties which requested the Secretariat of the Basel Convention and, as appropriate, in cooperation with other units in UNEP and other relevant international organizations, to organize national and regional seminars or workshops and training programmes on the implementation of the Basel Convention and the environmentally sound management of wastes and hazardous wastes; and to help promote the adoption of cleaner production methods and new low-waste technologies and invited Parties to contribute technically and financially towards the organization of seminars, workshops and training programmes and towards covering the cost of participation of developing country representatives,

Recognizing the need of developing countries, Parties of the Convention, for assistance through training activities to facilitate the implementation of the Basel Convention,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/20,

1. Requests the Secretariat, within available resources, to assist Parties and regions to develop training programmes, including curricula at national level in collaboration with national authorities, and continue to organize national and regional seminars or workshops and training programmes and curricula on the implementation of the Basel Convention and the environmentally sound management of wastes and hazardous wastes;

2. Further requests the Secretariat to promote the adoption of cleaner production methods and new low-waste technologies, in collaboration with relevant units in UNEP and other relevant international organizations, in particular with the Industry and Environment Programme Activity Centre of UNEP and UNITAR;

3. Also requests the Secretariat to continue promoting the environmentally sound management of wastes subject to the Basel Convention and to promote public awareness through participation in related international conferences, symposiums and seminars in order to make presentations and give lectures and to publish the newsletter and publications in this field;

4. Invites all Parties who are in position to do so to contribute technically, through, for example, contributions in kind of resource persons, and financially towards the organization of seminars, workshops and training programmes and towards covering the costs of participation of developing country representatives.

II/21. THE ROLE OF THE SECRETARIAT OF THE BASEL CONVENTION IN THE IMPLEMENTATION OF AGENDA 21

The Conference

Recalling Decision I/23 of the First Meeting of the Conference of the Parties on the Role of the Secretariat of the Basel Convention in the Implementation of Agenda 21 which called upon the Secretariat to carry out, within available resources, as a priority, a list of activities on issues raised in Agenda 21 which have relevance to the Basel Convention,

Aware of the need for assistance to developing countries in implementing the Convention,

And aware that Agenda 21 seeks to promote the development of control procedures for the transboundary movement of hazardous waste destined for recovery operations under the Basel Convention that encourage environmentally economically sound recycling operations,

Recognizing that very limited resources are available under the Convention to undertake this task,

1. Invites Parties and other countries to provide additional financial resources to the Technical Cooperation Trust Fund to enable the Secretariat to assist developing countries effectively in implementing the Convention, through the priority activities to be undertaken as set out in Agenda 21, and referred to in decision I/23;

2. Invites Parties and other countries to consider providing resource persons, experts in hazardous-waste-related issues, to advise developing countries, as required, in order to strengthen their institutional capacities in relation to the priority activities referred to in decision I/23.

II/22. GLOBAL WASTE SURVEY

The Conference

Recalling that the Parties at their first meeting were apprised of the information base being developed as a result of the Global Waste Survey and the potential benefit of such information in future decision-making on technical guidelines, technical centres, training and other capacity-building activities identified in decision I/23 of the Conference concerning the role of the Secretariat in the implementation of Agenda 21 of UNCED,

Further recalling that during the sixteenth Consultative Meeting of the Contracting Parties to the London Convention 1972 (November 1993) a number of parties to the London Convention 1972, which are also Parties to the Basel Convention, and the participating countries in the Global Waste Survey recognized that the Secretariat of the Basel Convention would be an appropriate forum to take over the Global Waste Survey, when the transitional phase carried out by IMO is completed,

Having considered the report by the Secretariat on the Global Waste Survey contained in document UNEP/CHW.2/24,

1. Requests the Secretariat to review further the relevance of the Global Waste Survey to the work of the Basel Convention and to report to the Bureau on its findings;

2. Requests, subject to the outcome of the review, the Secretariat of the Basel Convention to inform the Office for the London Convention 1972 on the readiness of the Parties to the Convention to keep,

maintain, review and update the Global Waste Inventory and Database as from 1995;

3. Requests the Secretariat of the Basel Convention to continue cooperating closely with IMO, the concerned UNEP offices, namely IE/PAC and IRPTC/PAC and with other interested intergovernmental organizations, in particular WHO, in the conduct of the Global Waste Survey;

4. Further requests the Secretariat of the Basel Convention to report on the decision of the Bureau and on any progress in the transfer and management of the Global Waste Inventory and Database to the Third Meeting of the Conference of the Parties in consultation with the Open-ended Ad Hoc Committee for the Implementation of the Basel Convention.

II/23. COOPERATION WITH THE UNITED NATIONS BODIES, SPECIALIZED AGENCIES AND REGIONAL SYSTEMS AND ORGANIZATIONS

The Conference

Recalling decision I/8 of the First Meeting of the Conference of the Parties to the Basel Convention requesting the Secretariat to continue its cooperation with all United Nations bodies, specialized agencies and regional systems and organizations, and other appropriate organizations in order to achieve the objectives of the Basel Convention,

Further recalling that the Parties at their first meeting agreed that the Secretariat of the Basel Convention should cooperate specially with the Customs Cooperation Council, and possibly IMO and other competent organizations in order to find means to achieve effective control at borders for transboundary movements of wastes (ref. paragraph 27 of the First Meeting of the Parties to the Basel Convention),

Having considered the report by the Secretariat on the implementation of decision I/8 contained in document UNEP/CHW.2/21,

1. Requests the Secretariat to continue its cooperation with the United Nations bodies, specialized agencies and regional systems and organizations and other international and regional organizations in the pursuance of the fulfilment of the obligations and achievement of the objectives of the Basel Convention;

2. Further requests the Secretariat to cooperate specifically with the Customs Co-operation Council and other relevant organizations in order to examine the possibility and practicability of including separate headings or sub-headings for hazardous wastes in the Harmonized System of the Customs Co-operation Council in order to enhance border control of these wastes.

II/24. COOPERATION BETWEEN THE INTERNATIONAL MARITIME ORGANIZATION AND THE UNITED NATIONS ENVIRONMENT PROGRAMME IN THE REVIEW OF EXISTING RULES, REGULATIONS AND PRACTICES WITH RESPECT TO TRANSPORT OF HAZARDOUS WASTES BY SEA

The Conference

Recalling decision I/18 of the First Meeting of the Conference of the Parties requesting the Secretariat to cooperate further with International Maritime Organization, and consult, as appropriate, with the United Nations Committee of Experts on the Transport of Dangerous Goods, as well as with other relevant international organizations, in the development of criteria for the definition of hazardous characteristics,

Having considered the report of the Secretariat on the implementation of decision I/18 contained

in document UNEP/CHW.2/22,

1. Requests the Secretariat to continue its cooperation, in particular, with the International Maritime Organization, the United Nations Economic Commission for Europe, the United Nations Industrial Development Organization, the International Programme of Chemical Safety, the Organisation for Economic Cooperation and Development and the European Union in the development of criteria for the definition of those hazardous characteristics which are currently not well defined, for the wastes subject to the Basel Convention and giving consideration to the work done in the respective intergovernmental organizations as well as in industrial organizations, to report to the Third Meeting of the Conference of the Parties on progress made in this issue;

2. Further requests its Technical Working Group to consider the issue of the development of criteria for the definition of those hazardous characteristics which are currently not well defined to review the report of the Informal Inter-Secretariats Consultation and to present its recommendations on the criteria and other matters required within the framework of the Basel Convention, to the Third Meeting of the Conference of the Parties for its consideration.

II/25. RESPONSIBILITY OF STATES FOR THE IMPLEMENTATION OF THE BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

The Conference

Recalling decision I/17 of the First Meeting of the Conference of the Parties, by which the Conference invited all States that had not done so to become Party to the Basel Convention,

Also recalling that in the same decision States Parties to the Convention were invited to cooperate in developing cleaner production technologies and cleaner products which would lead to the reduction and, as far as practicable, the elimination of the generation of hazardous wastes and the Secretariat of the Basel Convention was requested to facilitate cooperation between Parties to this effect,

Having considered the report prepared by the Secretariat contained in document UNEP/CHW.2/27,

1. Invites all States that have not done so to become Party to the Basel Convention;

2. Invites all Parties to the Convention who are currently using waste-minimization and cleaner production methods/technologies in their industrial processes to facilitate and cooperate in the transfer of such technologies to other interested Parties;

3. Appeals to all Parties who have not yet replied to the request from the Secretariat on initiatives taken by their respective Governments on cooperation on cleaner production technologies to do so at their earliest convenience to enable the Secretariat to circulate such information to all Parties to enable them to benefit from it;

4. Requests the Secretariat of the Basel Convention and, as appropriate, in cooperation with other units in UNEP, in particular the Industry and Environment Programme Activity Centre and other relevant United Nations organizations, to promote the development and adoption of cleaner production methods and new low-waste technologies leading to reduction of the generation of hazardous wastes by undertaking, *inter alia*, the following activities:

(a) Through the Technical Working Group of the Basel Convention identification of waste streams susceptible to cleaner production approaches;

(b) Identification of policy instruments which may promote improved waste minimization approaches at the national level, including estimation of incremental costs of implementing such policy instruments;

(c) Promotion of cleaner production through a more wide-ranging United Nations mechanism;

(d) In cooperation with other organizations, provision of printed material on cleaner production, including policy issues, to Parties, and organization of training courses and workshops on those issues;

(e) Provision of information exchange in technology assessment capacity;

(f) Mobilization of resources for cleaner production activities.

5. Invites Parties and other interested States and organizations through joint cooperation and other means, to contribute technically and financially towards the organization of workshops and seminars on the issue of waste minimization and cleaner production methods and the introduction of proven and environmentally sound technologies for disposal of hazardous wastes.

II/26. MANUAL FOR THE IMPLEMENTATION OF THE CONVENTION

The Conference

Recalling Decision I/3 of the First Meeting of the Conference of the Parties,

Having considered the report of the Secretariat contained in document UNEP/CHW.2/7,

1. Approves the Manual for immediate use;

2. Requests the Secretariat of the Basel Convention to ensure the dissemination of the Manual to all Parties and signatories in all the official languages of the United Nations;

3. Requests the Parties to ensure the wide dissemination of the Manual to legal or natural persons involved in the generation, export, import and/or disposal of hazardous wastes who express interest in receiving the Manual in order to make full use of the information contained therein;

4. Further requests the Secretariat to ask all Parties and non-Parties to comment on the Manual and, taking into account these comments, to prepare a revised Manual in consultation with the Open-Ended Ad Hoc Committee for the consideration of the third meeting of the Conference of the Parties to the Basel Convention.

II/27. INSTITUTIONAL, FINANCIAL AND PROCEDURAL ARRANGEMENTS

The Conference

Having considered the experience of its Bureau and the Secretariat during the period between the First and Second Meetings of the Conference of the Parties,

I. Institutional arrangements

1. Decides to expand its Bureau, when convened between two meetings of the Conference of the Parties, to include five additional representatives of Governments who served as officers of the previous Bureau of the Conference of the Parties. Within the policy agreed by the Conference of the Parties, the expanded Bureau shall:

(a) Provide general policy and general operational directions to the Secretariat between meetings of the Conference of the Parties;

(b) Provide guidance and advice to the Secretariat on the preparation of agendas and other requirements of meetings and on any other matters brought to it by the Secretariat in the exercise of its function;

(c) Oversee the development and execution of the Secretariat's budget as derived from the Trust Funds and other sources, and also all aspects of fund raising undertaken by the Secretariat;

(d) Draft decisions for consideration by the Conference of the Parties;

(e) Report to the Conference of the Parties on the activities it has carried out between meetings of the Conference of the Parties;

(f) Perform any other functions as may be entrusted to it by the Conference of the Parties.

II. Financial arrangements

1. Approves the distribution of the contributions of the Parties to the budget of 1994, as provisionally adopted by the Ad Hoc Committee at its meeting in October 1993 reflecting its most recent changes in the scale of assessment of the United Nations;

2. Endorses the decision of the Bureau of the Conference of the Parties at its first meeting as approved by the Ad Hoc Committee which, *inter alia*, approved the survey of the personnel of the Secretariat including levels and job descriptions, approved the proposed changes in the 1993 budget and adopted the 1994 budget with the proposed changes in components 1100 and 1300, and requests the Secretariat to take all actions necessary to ensure that the grades of the staff members are reflected as recommended;

3. Expresses its concern over the delays in payment of the agreed contributions by Parties as well as the voluntary contributions by Parties and non-Parties according to the agreements reached at the First Meeting of the Conference of the Parties in accordance with which: "all contributions are due to be paid in the year immediately preceding the year to which the contributions relate"; and urges the Parties and non-Parties to pay their contributions for 1994 according to the distribution of contributions approved by the Conference of the Parties as soon as possible to allow the Secretariat of the Convention to continue its work as decided by the Conference of the Parties;

4. Further approves the budget for the two Trust Funds for 1995/1996;

5. Provisionally adopts formulas for contribution to the Trust Fund for the Implementation of the Basel Convention based on the United Nations scale of assessment (attached) subject to comments/reservations reflected in the Report of the Second Meeting of the Conference of the Parties and pending further consideration by the Bureau and adoption by the next meeting of the Open-ended Ad Hoc Committee for the Implementation of the Convention;

6. Requests the Executive Director of UNEP to extend the two Trust Funds to the Basel Convention for 1995/1996 and 1997/1998 and *mutatis mutandis* its Terms of Reference as adopted by the First Meeting of the Conference of the Parties (Annex II of decision I/7), taking into account its paragraph 19 and ensuring ex-post-facto approval of the UNEP Governing Council for these extensions;

7. Further requests the Executive Director to provide the Bureau of the Conference of the Parties with a report on the implementation of paragraphs 16 and 17 of the Terms of Reference of the Trust Funds for the Basel Convention by the end of April for every previous year to ensure the transparency of the use of funds of the Contracting Parties;

8. Also requests the Executive Director of UNEP to advance funds to the Basel Convention on a reimbursable basis for operational requirements, including for technical cooperation activities;

9. Requests the Executive Director to consider and present to the Governing Council possibilities of supporting some activities and programmes recommended by the Bureau for the implementation of the Basel Convention on a non-reimbursable basis;

10. Requests the Secretariat to ensure the implementation of all decisions adopted by the Second Meeting of the Conference of the Parties within the approved budgets for 1994 and for 1995/1996, with the only limiting factor to be the resources within the approved budgets for 1994 and for 1995/1996.

III. Procedural arrangements

1. Decides that the Third Meeting of the Conference of the Parties will be held in September/October 1995, possibly in Nairobi if no additional cost is incurred. The Fourth Meeting of the Conference of the Parties shall be held in 1997.

DECISIONS ADOPTED BY THE THIRD MEETING OF THE CONFERENCE OF THE PARTIES

in Geneva, Switzerland
on 22 September 1995

III/1. AMENDMENT TO THE BASEL CONVENTION

The Conference

Recalling that at the first meeting of the Conference of the Parties to the Basel Convention, a request was made for the prohibition of hazardous waste shipments from industrialized countries to developing countries,

Recalling decision II/12 of the Conference,

Noting that:

- the Technical Working Group is instructed by this Conference to continue its work on hazard characterization of wastes subject to the Basel Convention (decision III/12);

- the Technical Working Group has already commenced its work on the development of lists of wastes which are hazardous and wastes which are not subject to the Convention;

- those lists (document UNEP/CHW.3/Inf.4) already offer useful guidance but are not yet complete or fully accepted;

- the Technical Working Group will develop technical guidelines to assist any Party or State that has sovereign right to conclude agreements or arrangements including those under Article 11 concerning the transboundary movement of hazardous wastes.

1. Instructs the Technical Working Group to give full priority to completing the work on hazard characterization and the development of lists and technical guidelines in order to submit them for approval to the fourth meeting of the Conference of the Parties;

2. Decides that the Conference of the Parties shall make a decision on a list(s) at its fourth meeting;

3. Decides to adopt the following amendment to the Convention:

"Insert new preambular paragraph 7 bis:

Recognizing that transboundary movements of hazardous wastes, especially to developing countries, have a high risk of not constituting an environmentally sound management of hazardous wastes as

required by this Convention;

Insert new Article 4A:

1. Each Party listed in Annex VII shall prohibit all transboundary movements of hazardous wastes which are destined for operations according to Annex IV A, to States not listed in Annex VII.

2. Each Party listed in Annex VII shall phase out by 31 December 1997, and prohibit as of that date, all transboundary movements of hazardous wastes under Article 1(I)(a) of the Convention which are destined for operations according to Annex IV B to States not listed in Annex VII. Such transboundary movement shall not be prohibited unless the wastes in question are characterised as hazardous under the Convention.

Annex VII

Parties and other States which are members of OECD, EC, Liechtenstein."

III/2. LIABILITY AND COMPENSATION

The Conference

Recalling decision II/1 of the second meeting of the Conference of the Parties,

1. Extends the mandate of the Ad Hoc Working Group of Legal and Technical Experts to Consider and Develop a Draft Protocol on Liability and Compensation for Damage Resulting From Transboundary Movements of Hazardous Wastes and their Disposal;

2. Takes note of the report presented to it by the Ad Hoc Working Group;

3. Requests the Ad Hoc Working Group to make all efforts possible to finalize the draft Articles of the Protocol, making use of informal meetings where possible, in order to present it for consideration and adoption by the fourth meeting of the Conference of the Parties to the Basel Convention.

III/3. EMERGENCY FUND

The Conference

Recalling decision II/2 of the second meeting of the Conference of the Parties,

1. Requests the Extended Bureau to:

(a) ensure that special consideration should be given, if appropriate through a special informal working group, to the issues related to establishing an emergency fund, including the elements required for its establishment;

(b) convene the special informal working group meeting, if possible, in conjunction with the Ad Hoc Working Group of Legal and Technical Experts to consider and develop a Draft Protocol on Liability and Compensation;

(c) present a progress report on the establishment of such an emergency fund to the fourth meeting of the Conference of the Parties, taking into account the relationship of an emergency fund and a draft protocol on liability and compensation and the work being done on that protocol by the Ad Hoc Working Group of Legal and Technical Experts.

III/4. SUBSIDIARY BODIES UNDER THE CONFERENCE OF THE PARTIES OF THE BASEL CONVENTION

The Conference

Recalling decision II/3 of the second meeting of the Conference of the Parties,

1. Welcomes the work of the Open-ended Ad Hoc Committee for the Implementation of the Basel Convention and requests it to meet as necessary between the meetings of the Conference of the Parties in order to fulfil the tasks placed on it by the Conference of the Parties, subject to available resources;

2. Welcomes also the work performed by the Technical Working Group and the Ad Hoc Working Group of Legal and Technical Experts and request them to continue their meetings as necessary between the meetings of the Conference of the Parties in order to fulfil the tasks placed on them by the Conference of the Parties, subject to available resources;

3. Requests the Open-ended Ad Hoc Committee to fulfil the task placed on it by decisions 9, 17 and 19 and present a report on its work to the fourth meeting of the Conference of the Parties;

4. Requests the Secretariat of the Basel Convention in consultation with the Bureau of the Conference of the Parties to convene the Open-ended Ad Hoc Committee when necessary, making use of informal meetings, subject to availability of resources;

5. Authorizes the Extended Bureau to perform some functions of the Open-ended Ad Hoc Committee, especially administrative tasks and the preparation of recommendations for the meeting of the Conference of the Parties taking into account the need for the rational use of limited financial resources available under the Basel Convention Trust Fund.

III/5. ILLEGAL TRAFFIC IN HAZARDOUS WASTES AND OTHER WASTES

The Conference

Recalling decision II/4 of the second meeting of the Conference of the Parties,

1. Decides that a form be developed for use by Parties to report cases of confirmed illegal traffic;

2. Requests the Technical Working Group to review and revise the draft form developed by the Secretariat of the Basel Convention and attached to this document as Appendix;

3. Requests Parties to review the draft form and submit comments for consideration by the Technical Working Group;

4. Requests Parties to cooperate with each other and the Secretariat of the Basel Convention on alleged cases of illegal traffic;

5. Requests the Parties to:

(a) promulgate or develop stringent legislation on the control of transboundary movements of hazardous wastes and incorporate in this legal system appropriate sanctions or penalties for the illegal traffic in hazardous wastes and other wastes, to take appropriate measures to ensure the effective implementation of this legislation and inform the Secretariat of the Basel Convention thereon;

(b) provide the Secretariat of the Basel Convention with replies regarding the reported cases on illegal traffic;

(c) extend cooperation with Interpol with a view to presenting to future

meetings of the Contracting Parties detailed reports on activities undertaken by the Secretariat of the Basel Convention and Interpol to prevent illegal traffic in hazardous wastes and to provide detailed reports to the Bureau and the meetings of the Contracting Parties on any cases of illegal traffic, their sources, actions undertaken by the governments during the discovery of cases and follow-up activities by the Contracting Parties.

6. Requests the Secretariat of the Basel Convention to:

(a) assist Parties in developing national legislation to deal with illegal traffic in hazardous wastes;

(b) assist Parties in capacity-building including the development of an appropriate infrastructure with a view to preventing and penalizing cases of illegal traffic in hazardous wastes and other wastes and to ensuring the involvement of national authorities and focal points for the Basel Convention in the prevention and monitoring of illegal traffic in hazardous wastes and other wastes;

(c) continue its cooperation with the various regional commissions and secretariats of regional conventions and protocols, NGOs, industry, private sector, as well as the World Customs Organization (WCO) and Interpol in order to achieve a better control and monitoring of cases or alleged cases of illegal traffic in hazardous wastes and other wastes;

(d) organize training courses for customs officers, port authorities, judiciary personnel and police forces in cooperation with WCO, Interpol and other appropriate bodies, including UN regional commissions and secretariats of regional agreements dealing with similar aspects.

III/6. MODEL NATIONAL LEGISLATION FOR THE TRANSBOUNDARY MOVEMENT AND MANAGEMENT OF HAZARDOUS WASTES

The Conference

Recalling decision II/5 of the second meeting of the Conference of the Parties,

1. Approves the revised Model National Legislation for immediate use;

2. Requests the Secretariat of the Basel Convention to disseminate the Model National Legislation to all States;

3. Also requests the Secretariat of the Basel Convention, in providing technical assistance in the field of national legislation, to take into account, *inter alia*, the revised Model National Legislation.

III/7. DESIGNATION OF COMPETENT AUTHORITIES AND FOCAL POINTS

The Conference

Recalling Article 5 of the Basel Convention and decision II/6 of the second meeting of the Conference of the Parties,

1. Requests Parties which have not yet informed the Secretariat of the Basel Convention of the designation of their Competent Authorities and Focal Points to do so as soon as possible.

III/8. MANUAL FOR THE IMPLEMENTATION OF THE BASEL CONVENTION

The Conference

Recalling decision II/26 of the second meeting of the Conference of the Parties,

1. Approves the Manual for use by the Contracting Parties, other States and interested organizations and bodies;

2. Requests the Secretariat of the Basel Convention to ensure the publication and dissemination of the Manual to all Parties;

3. Requests the Parties to ensure the wide dissemination of the Manual to all bodies, national authorities and persons involved in the generation, export, import and/or disposal of hazardous wastes who express interest in receiving the Manual in order to make full use of the information contained in this document.

III/9. BILATERAL, MULTILATERAL AND REGIONAL AGREEMENTS OR ARRANGEMENTS

The Conference

Recalling decision II/10 of the second meeting of the Conference of the Parties,

1. Requests the Parties which have entered, in accordance with Article 11, into bilateral, multilateral and regional agreements or arrangements to continue to report, consistent with national laws and regulations, to the Open-ended Ad Hoc Committee, through the Secretariat of the Basel Convention, on the conformity of such agreements or arrangements with the provisions of the Basel Convention taking into consideration the list of questions annexed to decision II/10;

2. Requests the Secretariat of the Basel Convention to update the compilation containing the bilateral and multilateral agreements or arrangements to circulate it to the Parties to the Basel Convention.

III/10. EVALUATION OF THE EFFECTIVENESS OF THE BASEL CONVENTION

The Conference

Recalling Article 15, paragraph 7, of the Basel Convention which requests the Conference of the Parties to "undertake three years after the entry into force of this Convention, and at least every six years thereafter, an evaluation of its effectiveness...",

Recalling also Article 15, paragraph 5(c), which allows the Conference to "consider and undertake any additional action that may be required for the achievement of the purposes of this Convention in the light of experience gained in its operation and in the operation of the agreements and arrangements envisaged in Article 11",

Having noted documents UNEP/CHW.3/31 and UNEP/CHW.3/Inf.7 containing the summary and the study on "Evaluation of the Effectiveness of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal",

Recognizing that the Basel Convention has contributed to the control of transboundary movements of hazardous wastes and their management in an environmentally sound manner,

Recognizing also the valuable support and assistance of the Secretariat of the Basel Convention

provided to developing countries and countries with economies in transition,

1. Invites non-Parties to the Convention to become Parties as soon as possible in order to ensure the global role of the Convention in controlling the movement and the environmentally sound management of hazardous wastes;

2. Further requests the Parties to:

(a) take the legal and technical steps necessary for the implementation of the Convention at the national level in order to ensure its effectiveness;

(b) accelerate the early adoption of the Protocol on Liability and Compensation as well as additional technical guidelines for the environmentally sound management of hazardous wastes which will enhance the effectiveness of the Convention;

(c) to pay on time the contribution based on the UN scale of assessments approved by the Conference of the Parties and to provide the Secretariat of the Basel Convention with additional resources on a voluntary basis to enable it to undertake the tasks entrusted to it.

3. Requests the Secretariat of the Basel Convention:

(a) to continue providing the necessary assistance to the Parties, in particular to developing countries and countries with economies in transition, in order to enable them to effectively fulfil their obligations under the Convention and hence ensure its effectiveness;

(b) to continue its cooperation with other UN bodies, international and regional organizations as well as the private sector and NGOs in all aspects related to the implementation of the Basel Convention.

III/11. MONITORING THE IMPLEMENTATION OF AND COMPLIANCE WITH THE OBLIGATIONS SET OUT BY THE BASEL CONVENTION

The Conference

Recalling Article 19 of the Basel Convention,

Further recalling decision II/3 of the Open-ended Ad Hoc Committee for the Implementation of the Basel Convention,

1. Takes note of the study reflected in document UNEP/CHW.3/Inf.5 entitled "Monitoring Implementation of and Compliance with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Other Wastes and their Disposal";

2. Requests the Consultative sub-group of Legal and Technical Experts to study all issues related to the establishment of a mechanism for monitoring implementation of and compliance with the Basel Convention and its design, and to report its findings to the fourth meeting of the Conference of the Parties to the Basel Convention.

III/12. HAZARD CHARACTERIZATION

The Conference

Referring to Decision II/13 of the second meeting of the Conference of the Parties, wishes to:

1. Take note of the guidance developed by the Technical Working Group on the use of Annex I and Annex III of the Basel Convention and the lists of wastes in the report of the eighth session of the Technical Working Group, and request the Technical Working Group to continue its work on this guidance;

2. Request the Technical Working Group to:

(a) continue work on criteria for hazardous characteristics in conjunction with Annex I (Categories of wastes to be controlled) of the Basel Convention, in particular for classes H10 to H13. The development of criteria should avoid, where possible, the need for complex and costly testing;

(b) initiate a programme of work for the characteristics H10-H12 in cooperation with appropriate international organizations;

(c) continue work on developing guidance for the use of characteristic H13. In particular by identifying the purpose and the wastes for which countries consider H13 to be important.

3. Request the Technical Working Group to:

(a) further work on exploring limit values for use when appropriate in applying the de minimis approach;

(b) identify those chemical constituents, in Annex I, which require further description in order to differentiate better between those constituents that always cause a waste (subject to the de minimis approach mentioned above) to be hazardous and those that do not necessarily cause a waste to be hazardous;

(c) consider ways of taking forward the development of lists of hazardous wastes and the applicable procedure for their review based on the outcome of the work of the Technical Working Group, in particular the outcome of its seventh and eighth sessions as well as further developing lists of wastes not covered by the Basel Convention.

4. Request the Technical Working Group to report on the above activities to the fourth meeting of the Conference of the Parties.

III/13. TECHNICAL GUIDELINES FOR THE ENVIRONMENTALLY SOUND MANAGEMENT OF WASTES SUBJECT TO THE BASEL CONVENTION

The Conference

Referring to decisions II/13 and II/25 of the second meeting of the Conference of the Parties, wishes to:

1. Confirm the decision of COP2 and adopt the three Technical Guidelines on:

- specially engineered landfill (D5)
- incineration on land (D10)
- used oil re-refining or other re-uses of previously used oil (R9)
- and request SBC to disseminate them to Parties, non-Parties, international organizations and others in all UN languages as appropriate

2. Extend the mandate of the Technical Working Group to:

(a) further develop the draft technical guidelines on Physico-chemical Treatment (D9) and

Biological Treatment (D8);

(b) prepare draft technical guidelines:

- on recycling/reclamation of metals and metal compounds (R4)
- wastes resulting from surface treatment of metals and plastics (Y17)
- clinical wastes from medical care in hospitals, medical centres and clinics (Y1), in close cooperation with WHO and UN/CETDG

(c) continue with the work of selecting hazardous waste streams susceptible to cleaner production approaches within the framework of the Basel Convention, taking into account available resources, and making use of relevant experience in other fora.

3. Request the Technical Working Group to report on progress on the above listed activities to COP4;

4. Invite Parties to cooperate with each other in carrying out technical projects, in consultation with and/or through SBC, to address the needs of developing countries and countries with economies in transition Party to the Convention, for access to information and/or on transfer of cleaner production technologies.

III/14. TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES DESTINED FOR RECOVERY OPERATIONS

The Conference

Referring to decision II/14 of the second meeting of the Conference of the Parties, wishes to:

1. Adopt the Guidance Document on Transboundary Movements of Hazardous Wastes destined for Recovery Operations;

2. Request SBC to issue and disseminate it to all Parties to the Convention, non-Parties, international organizations and other concerned bodies;

3. Request SBC to initiate under the guidance of the Technical Working Group case studies providing the elements for improving the recovery of hazardous wastes in non-OECD countries through assessment of the functioning of recovery facilities and identification of ways and means to aim at the environmentally sound management of the hazardous wastes to be recovered and the recovery operations themselves along the lines of operational paragraph 3 of decision II/14 adopted by COP2 and the terms of reference annexed to it;

4. Request SBC to report to the COP4 through the Technical Working Group on progress made with the implementation of case studies and/or outcome of such case studies if completed as well as on further work undertaken on recovery operation practices.

III/15. POSSIBLE EFFECTS OF THE BASEL CONVENTION ON THE TRANSBOUNDARY MOVEMENTS OF RECLAIMED OZONE-DEPLETING CHEMICALS

The Conference

Referring to decision II/15 of COP2 and to further consultations with the Contracting Parties and Secretariat of the Montreal Protocol, agrees that,

1. The controlled substances of the Montreal Protocol which are reclaimed and purified to usable purity specifications prescribed by appropriate international and/or national organizations including the

International Standards Organization (ISO) do not fall under the scope of the Basel Convention.

III/16. DOCUMENTATION: NOTIFICATION AND MOVEMENT DOCUMENT

The Conference

Referring to decision II/16 of the second meeting of the Conference of the Parties, wishes to:

1. Decide that the terminology to be used on the forms should be according to the Basel Convention;

2. Further decide to recommend that the duly completed Notification will always accompany the Movement Document;

3. Taking into consideration (a) and (b) above, agree to adopt the revised format of the Notification and Movement Document;

4. Also agree to adopt provisionally the Instruction Manual accompanying the Notification and Movement Document and request SBC to finalize the Instruction Manual.

III/17. TRANSMISSION OF INFORMATION

The Conference

Referring to decision II/17 of the second meeting of the Conference of the Parties, wishes to:

1. Invite Parties to cooperate with each other in the following areas in order to facilitate the implementation of the Basel Convention including the reporting on Article 13 of the Convention:

- training in the use of Notification and Movement Document;

- assessment of the potential harmful effects on health and the environment by exposure to hazardous wastes;

- monitoring the effects of the management of hazardous wastes on human health and environment;

- assessment of the potential benefits and implementation costs of introducing economic instruments for the promotion of all aspects of waste minimization including cleaner production;

- establishment of environmentally sound disposal facilities for hazardous wastes as close as possible to the source of generation and/or to make available disposal facilities in their own countries;
- identification of the main hazardous waste streams generated in their countries and setting up and maintenance of inventories in this respect.

2. Request the Secretariat to prepare a standardized format for reporting on additional national definitions of hazardous wastes in accordance with Article 3 of the Convention;

3. Invite Parties to set up appropriate procedures to monitor transboundary movements of hazardous wastes including reporting on accidents occurred in this connection and to consider to include reference to such accidents in the format for the Movement Document;

4. Welcome the preparation by the Secretariat of Country Fact Sheets based on information provided by the Parties as well as the preparation of tables on statistics on import/export and on

generation of hazardous wastes and request the Secretariat to continue with this work and to explore additional ways of presenting complete information;

5. Request all Parties to report as soon as possible to the Secretariat of the Basel Convention on activities pertinent to the calendar year 1994 in relation to Article 13 of the Basel Convention using the format for reporting developed by the Secretariat and also to report on the amount of hazardous wastes generated in their countries within the same calendar year;

6. Further request all Parties to report on or provide additional information on Article 16 of the Convention in relation to paragraph 1(g) using the format provided by the Secretariat for this purpose;

7. Request the Secretariat to report to the third session of the Open-ended Ad Hoc Committee on information provided by Parties under Article 13 for the calendar year 1994 and on information on hazardous wastes generated, as well as on information provided under Article 16 1(g) and present this information in a compiled and summarized form.

III/18. ESTABLISHMENT OF THE INFORMATION MANAGEMENT SYSTEM ON WASTES (IMSW) OF THE BASEL CONVENTION

The Conference

Referring to decision II/18 of the second meeting of the Conference of the Parties, wishes to:

1. Request the Secretariat to progress with the establishment of the IMSW and report to COP4 on progress made;

2. Further request the Secretariat, while developing the IMSW, to prepare a management status and explain the purpose, design and deliverability of the project and submit it to the Technical Working Group for consideration and guidance;

3. Also request SBC to continue its consultation with UNCTAD on the collection of statistics on transboundary movements of hazardous wastes and other wastes destined for recovery operations;

4. Further request SBC to pursue consultation with UN-ECE, EUROSTAT and other appropriate bodies on the development of common terminology for waste with a view to aiming towards classification systems that could be comparable.

III/19. ESTABLISHMENT OF REGIONAL OR SUB-REGIONAL CENTRES FOR TRAINING AND TECHNOLOGY TRANSFER REGARDING THE MANAGEMENT OF HAZARDOUS WASTES AND OTHER WASTES AND THE MINIMIZATION OF THEIR GENERATION

The Conference

Referring to decision II/19 of the second meeting of the Conference of the Parties and Committee Decision II/1 of the second session of the open-ended Ad Hoc Committee on the Establishment of Centres with its Appendix, wishes to:

1. Express its appreciation for the countries which provided in-kind contribution to the Secretariat in carrying out the feasibility studies for the Latin America and Caribbean region, for the Central and Eastern Europe region and for the Asian region;

2. Select sites for the establishment of the regional and sub-regional centres for training and technology transfer regarding the management of hazardous wastes and other wastes and the

minimization of their generation:

(a) For the Latin America and Caribbean region by:

- Selecting Uruguay as the coordinating centre for this region with three sub-regional centres: Argentina for the South America sub-region; El Salvador for Central America sub-region including Mexico; and Trinidad and Tobago for the Caribbean sub-region;

- Recommending that the approach for the establishment of regional/sub-regional centres in Latin America and the Caribbean could be adopted for other regions.[18]

(b) For the African region by:

- Selecting Nigeria as the coordinating centre for this region with three sub-regional centres: Egypt for Arabic-speaking countries in Africa, which will serve the other Arabic-speaking countries; South Africa for English-speaking countries in Africa; and a third sub-regional centre, yet to be selected, for French-speaking countries in Africa. Reports on further studies in relation to the African region are to be presented to the next meeting of the Bureau or the third session of the Open-ended Ad Hoc Committee.

(c) For the Central and Eastern Europe region by:

- Selecting the Slovak Republic for the Central Europe sub-region; the Russian Federation for the Eastern Europe sub-region; possibly, subsequently, a third sub-regional centre in Estonia; and by appointing a central coordinating body.

(d) For the Asia and Pacific region by:

- Selecting China and Indonesia as regional centres.

3. In view of recommendations presented in the report of the feasibility study on the establishment of Asian regional centres, it was reiterated by the Indian delegation that India could be considered as a possible host for a regional or sub-regional centre subject to further consultation at national level on the site for such a centre and to consultations with the Secretariat of the Basel Convention on what could be the possible relation of such a centre in India with the other centres in the Asian region, namely those in China and Indonesia;

4. Invite those countries in a position to do so, individually or collectively, on a bilateral or multilateral basis, to provide financial resources and/or technically qualified person(s) recruited from government, the private sector or environmental NGOs to collaborate in the establishment of centres for which sites have been agreed upon and in this connection take note of the offer from ICC to collaborate on this matter;

5. Invite those countries in a position to do so, individually or collectively, on a bilateral or multilateral basis, to provide financial resources and/or technically qualified person(s) recruited from government, the private sector or environmental NGOs to collaborate in the undertaking of studies for Africa and Western Asia. The interest expressed by representatives from ICC and UNIDO regarding collaboration on this matter should be followed up;

6. Invite the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), the United Nations Organization for Industrial Development (UNIDO) and the

[18] Seminar in El Salvador (June 1995) led to the arrangements by which host countries for the future sub-regional centers in Central America and the Caribbean undertook to prepare detailed project proposals to be submitted for funding to interested Parties and relevant international organizations through SBC.

United Nations regional economic commissions, to assist the Parties to the Basel Convention and the Secretariat in the completion of remaining studies as well as assisting and collaborating in the process of establishing centres for training and technology transfer in all five regions. It also invites the World Bank, Regional and Sub-regional Development Banks, the GEF, United Nations Department of Policy Coordination and Sustainable Development (UN-DPCSD) as well as the private sector to assist in the establishment of these centres;

7. Invite the Technical Working Group to cooperate on the establishment of the regional centres for training and technology transfer regarding the management of hazardous wastes and other wastes and the minimization of their generation within the framework of the Basel Convention as a major component in capacity building activities particularly in developing countries and countries with economies in transition;

8. Note that a component of the work of the regional/sub-regional centres should be to provide advice on the avoidance of inappropriate technology transfer and encouragement of cleaner technologies and sound hazardous waste management practices;

9. Further note, that Senegal has indicated its interest in being considered for selection as a sub-regional centre for French-speaking countries in Africa;

10. Request the Secretariat to report to the third session of the Open-ended Ad Hoc Committee or to another appropriate body on progress made in the establishment of regional centres on training and technology transfer in Latin America and the Caribbean, in Asia, in Central and Eastern Europe, in Africa and in Western Asia.

III/20. TRAINING AND SEMINARS RELATED TO THE BASEL CONVENTION

The Conference

Referring to decision II/20 of the second meeting of the Conference of the Parties, wishes to:

1. Request the Secretariat to continue developing training programmes, including curricula at national level in collaboration with national authorities, and organizing national and regional training activities on the implementation of the Basel Convention in collaboration with UNEP and other international organizations and as far as possible within the framework of the regional/sub-regional centres for training and technology transfer presently being established under the Basel Convention;

2. Also request the Secretariat to continue promoting public awareness on the aims of the Basel Convention through for example participation in related international conferences, symposia and seminars and by publishing newsletters and other publications/material in this field;

3. Urge Parties to contribute to the Technical Cooperation Trust Fund to assist developing countries Parties in the implementation of the Basel Convention and invite all Parties who are in a position to do so to contribute to the Trust Funds to cover the costs of participation of developing country representatives at meetings and seminars organized by the Secretariat of the Basel Convention, or in kind through i.a. the provision of resource persons for the organization of seminars, workshops and training programmes;

4. Also invite Parties to collaborate with each other on a bilateral basis in the development and implementation of training programmes as well as public awareness activities on the implementation of the Basel Convention.

III/21. TECHNICAL ASSISTANCE UNDER THE BASEL CONVENTION INCLUDING FOR THE IMPLEMENTATION OF AGENDA 21

The Conference

Recalling decision I/23 of the first meeting of the Conference of the Parties and decisions II/20 and II/21 of the second meeting of the Conference of the Parties,

1. Invites Parties and non-Parties as well as interested IGOs to provide financial resources to the Technical Cooperation Trust Fund to enable the Secretariat of the Basel Convention to assist developing countries and countries with economies in transition effectively in implementing the Convention including through activities in Agenda 21 of direct relevance to the Convention;

2. Also invites Parties, non-Parties and relevant international organizations to contribute in kind to activities to be carried out for developing countries and countries with economies in transition in the field of environmentally sound management of hazardous by providing resource persons, experts in hazardous waste related issues, to advise these countries as required in strengthening their institutional capacities for the implementation of the Basel Convention and/or to provide in-service training for experts from these countries;

3. Invites Parties and other countries to consider providing support directly on a bilateral basis for project proposals and requests for assistance received from Parties which are developing countries and countries with economies in transition through the Secretariat of the Basel Convention and keep the Secretariat informed on the implementation of activities in this respect.

III/22. COOPERATION WITH THE INTERNATIONAL ATOMIC ENERGY AGENCY

The Conference

Recalling decision II/11 of the second meeting of the Conference of the Parties,

1. Welcomes the preparation by the IAEA of a draft Convention on Safety of Management of Radioactive Wastes;

2. Requests the Secretariat of the Basel Convention to continue its cooperation with the IAEA in particular in the preparation of a draft Convention on Safety of Management of Radioactive Wastes particularly in relation to the question of the inclusion of low-level radioactive wastes in its scope;

3. Further requests the Secretariat of the Basel Convention to report to the fourth meeting of the Conference of the Parties on the progress made on the Secretariat of the Basel Convention's cooperation with IAEA on the elaboration of the draft Convention on Safety of Management of Radioactive Wastes.

III/23. RELATIONSHIP OF THE BASEL CONVENTION AND THE LONDON CONVENTION, 1972

The Conference

Recalling decisions II/7 and II/22 of the second meeting of the Conference of the Parties,

1. Invites Parties to the London Convention, 1972, which are not Parties to the Basel Convention to become Parties in order to facilitate the coordination between the two Conventions;

2. Welcomes the decisions by the 16th Consultative Meeting of the London Convention, 1972, to prohibit the dumping of industrial wastes and radioactive wastes and other radioactive matter at sea, as well as the incineration at sea of industrial wastes and sewage sludge;

3. Requests the Secretariat of the Basel Convention to continue its cooperation with the

Consultative Meeting of the London Convention, 1972 and the IMO in the preparatory process for the amendment of the London Convention, 1972 in order to achieve the goal of coordination between the two Conventions and to report to the fourth meeting of the Conference of the Parties to the Basel Convention;

4. Further requests the Secretariat of the Basel Convention to continue to cooperate with the Consultative Meeting of the London Convention, 1972 and the IMO with a view to ensuring that there is no duplication of activities to be carried out under both the Basel and the London Conventions, and with a view to ensuring their complementarity;

5. Also requests the Secretariat of the Basel Convention to further investigate, in cooperation with the Consultative Meeting of the London Convention, 1972 and the IMO, the impact of the ban of the disposal of industrial wastes at sea on the treatment and disposal of hazardous waste on land, which might affect their transboundary movement.

III/24. COOPERATION BETWEEN THE INTERNATIONAL MARITIME ORGANIZATIONAND THE BASEL CONVENTION, IN THE REVIEW OF EXISTING RULES, REGULATIONS AND PRACTICES WITH RESPECT TO TRANSPORT OF HAZARDOUS WASTES BY SEA

The Conference

Referring to decision II/24 of the second meeting of the Conference of the Parties wishes to:

1. Request SBC to further strengthen its cooperation with IMO and other relevant UN bodies, such as the UN Committee of Experts on the Transport of Dangerous Goods, the UN Economic Commission for Europe (UN-ECE), the Inter-organization Programme of Sound Management of Chemicals, and the International Programme on Chemical Safety (IPCS) with a view to bringing them to participate fully and to contribute to the work undertaken by the Technical Working Group on hazard characterization of wastes subject to the Basel Convention and to pursue work on harmonization of criteria for the classification of hazardous wastes;

2. Further request SBC to continue its cooperation in this field with the IMO as well as with other intergovernmental organizations, in particular, OECD and the European Commission;

3. Also request that the cooperation of SBC on the subject of harmonization of criteria for the classification of hazardous wastes be extended to concerned non-governmental organizations and the private sector, particularly the Council of the Federation of European Chemical Industries (CEFIC); the Oil Companies' European Organization for Environmental and Health Protection (CONCAWE); European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC), and International Petroleum Industry Environmental Conservation Association (IPIECA).

III/25. FOLLOW-UP TO UNEP GOVERNING COUNCIL DECISIONS CONCERNING ENVIRONMENTALLY SOUND MANAGEMENT OF HAZARDOUS WASTES

The Conference

Referring to decision II/9 of the second meeting of the Conference of the Parties, wishes to:

1. Appreciate the work done by the Secretariat of the Basel Convention on the Implementation of the three UNEP Governing Council 17 Decisions, namely:

- 17/5 - Application of environmental norms by military establishments;
- 17/13 - Carriage of irradiated nuclear fuel by sea; and

- 17/18 - Environmentally sound management of hazardous wastes.

2. Request the Secretariat of the Basel Convention to cooperate with UNEP Headquarters and its Regional Offices in the fields related to subjects covered by the above referred to UNEP 17th Governing Council Decisions to the extent to which the activities of the above three subject areas are covered by the provisions of the Basel Convention and decision of its Contracting Parties.

III/26. COOPERATION WITH UN BODIES, SPECIALIZED AGENCIES AND REGIONAL SYSTEMS AND ORGANIZATIONS

The Conference

Referring to decision II/23 of the second meeting of the Conference of the Parties, wishes to:

1. Request SBC to continue its cooperation with the following organizations in order to pursue the fulfilment of the objectives and obligations of the Convention, in particular:

- United Nations bodies and specialized agencies, namely: UNCETDG, UN-CHS (Habitat), UNCTAD, UN-DHA, UN-DPCSD, UNDP, ILZSG, UNEP, UNITAR, UN Regional Commissions (ECA; ECE; ECLAC; ESCAP; ESCWA), the World Bank and FAO, IAEA, ILO, IMO, PAHO, UNIDO and WHO;

- Other intergovernmental organizations such as CARICOM, CEPIS, the Commonwealth, CPPS, Interpol, IOPC Fund, NATO, OAU, OECD, ROPME, SPF, SPREP and WCO;

- Political and/or economic integration organizations such as the European Community.

(i) with UN-CETDG and UN-ECE on matters concerning recommendations, rules and regulations governing the transport of hazardous wastes and on harmonization of criteria for environmentally hazardous substances including waste, in the area of the hazard characterization of wastes subject to the Basel Convention and on the work of UN-ECE/EUROSTAT developing standard terminology for waste and recycling;

(ii) with FAO and UNIDO, and in cooperation with UNEP/IRPTC, on the environmentally sound disposal of obsolete and unwanted pesticides stock in developing countries;

(iii) with ILO on exchange of information on cleaner production issues as a means to minimize hazardous wastes arising and consequences for occupational health and safety;

(iv) with WHO in the preparation of Technical Guidelines for clinical wastes (Y1) as recommended by the Technical Working Group, in the development of training programmes concerning or related to the effects of hazardous wastes on health and in the establishment of regional or sub-regional centres for training and technology transfer;

(v) with OECD in the work of its Waste Management Policy Group in particular regarding separate identification of hazardous wastes in the Harmonized System of the World Customs Organization, the environmentally sound management of hazardous wastes destined for recovery operations, training and waste minimization. In the preparation of technical guidelines for the environmentally sound management of hazardous wastes subject to the Basel Convention and the establishment of regional centres for training and technology transfer;

(vi) with WCO in cooperation with OECD and the EC, in the separate identification of wastes subject to the Convention in the Harmonized System, with the WCO and its Contracting Parties to accelerate its work on the inclusion into the Harmonized System of the WCO of the entries for hazardous wastes covered by the Basel Convention and to accelerate its work on the modalities of this inclusion;

(vii) with the EC on the preparation of technical guidelines for the environmentally sound management of wastes subject to the Basel Convention, on the separate identification of wastes covered by the Convention in the Harmonized System and on hazard characterization of wastes within the framework of the Convention;

(viii) with ICC, BIAC and other private sector and business organizations in the area of hazard characterization of the wastes subject to the Convention, on the preparation of technical guidelines, on the development of the Protocol on Liability and Compensation, and on the establishment of regional centres for training and technology transfer.

2. Appeal to the United Nations bodies, specialized agencies and organizations and other international and regional organizations to consider joint collaboration including financing projects with the SBC for the implementation of the Basel Convention, to provide resource persons for training courses or technical assistance missions organized through the SBC and to keep SBC informed about hazardous waste related activities organized by them such as training courses in order to forward such information to the Parties of the Basel Convention.

III/27. COOPERATION BETWEEN THE BASEL CONVENTION AND THE ACTIVITIES UNDERTAKEN AT THE GLOBAL LEVEL LEADING TO THE DEVELOPMENT OF THE LEGALLY BINDING INSTRUMENT ON TRADE IN HAZARDOUS CHEMICALS INCLUDING THE PRIOR INFORMED CONSENT (PIC) CONCEPT

The Conference

1. Requests the Secretariat to cooperate with the government-designated group of experts on Prior Informed Consent (PIC) for hazardous chemicals convened by UNEP in cooperation with FAO in accordance with UNEP Governing Council decision 18/12 to enable the group to benefit from the experience gained in the implementation of the Basel Convention;

2. Invites Parties to provide assistance or guidance to the Secretariat on this matter;

3. Further requests the Secretariat to report on progress to the fourth meeting of the Conference of the Parties.

III/28. INSTITUTIONAL, FINANCIAL AND PROCEDURAL ARRANGEMENTS

The Conference

Referring to decision II/27 of the second meeting of the Conference of the Parties,

Having considered the experience of the work of the Extended Bureau and the Secretariat of the Basel Convention during the period between the second and third meetings of the Conference of the Parties,

I. Institutional arrangements

1. Decides, with reference to its decision II/27, that its extended Bureau should also include the persons elected to chair the Open-ended Ad Hoc Committee, the Technical Working Group and the Ad Hoc Working Group of Legal and Technical Experts, subject to the provision that if a national of one State would otherwise occupy more than one position on the Extended Bureau, the relevant regional group may nominate a representative of another State to fill the other seat on the Bureau.

2. Requests the extended Bureau to initiate work on the development of a Memorandum of

Understanding between the Conference of the Parties to the Basel Convention and UNEP, as host organization of its Secretariat.

3. Decides to name the head of the Secretariat "Executive Secretary" instead of "Coordinator" with a view to easing the comparison with the nomenclature used by other global environmental conventions.

4. In accordance with paragraph 8 of the Terms of Reference for the administration of the Trust Funds for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, authorizes the Executive Secretary to make transfers, between each of the main appropriation lines set out in the budget, up to the aggregate limit of 15 per cent of the total estimated expenditure for those appropriation lines, provided that a further limitation of up to minus 25 per cent of each such appropriation lines shall apply.

5. Requests the travel arrangements for participants to follow the UN rules.

II. Financial arrangements

6. Expresses its concern over the delays in payment of the agreed contributions by Parties as well as the voluntary contributions by Parties and non-Parties according to the agreements reached at the first meeting of the Conference of the Parties in accordance with which: "all contributions are due to be paid in the year immediately preceding the year to which the contributions relate".

7. Approves the budget for the Trust Fund for the Implementation of the Basel Convention in the amount of US$ 2,854,805 to be met from the allocated scale of assessments, and an additional amount of US$1,096,395 as voluntary contributions for 1997 (Annex I to this decision).

8. Approves the budget for the Trust Fund for the Implementation of the Basel Convention in the amount of US$ 2,940,449 to be met from the allocated scale of assessments, and an additional amount of US$1,129,291 as voluntary contributions for 1998 (Annex II to this decision).

9. Approves the budget for the Technical Cooperation Trust Fund to Assist Developing Countries subject to voluntary contributions (Annex III to this decision).

10. Approves the document on financial implications of decisions of the third meeting of the Conference of the Parties to the Basel Convention for 1997, which is expected to be reviewed on a continuous basis by the meetings of the Extended Bureau to the Basel Convention subject to priorities set up by the Institutional and Legal as well as Technical Working Groups of the third meeting of the Conference of the Parties and subject to availability of funds (doc.UNEP/CHW.3/36).

11. Invites Parties to notify the Secretariat of the Basel Convention of all contributions made to the Basel Convention Trust Funds at the time such payments are made.

12. Invites the Executive Director to request that the collection of contributions to the Trust Funds of the Basel Convention is done through the existing Geneva UNEP bank account and is managed by the Geneva located financial services so that the collection and control of funds is made more efficient and effective.

13. Welcomes the decision by the UNEP/GC.18 adopted in May 1995 to provide strategic, scientific, technical and administrative support to the implementation of the Basel Convention for the biennium 1996-1997 at the level of US$ 446,000 and suggests that priority should be given to the implementation of the decisions on the establishment of regional or sub-regional centres for training and technology transfer regarding the management of hazardous wastes and other wastes and the minimization of their generation and on training and seminars related to the Basel Convention.

14. Requests the Executive Director of UNEP to advance funds to the Basel Convention on a reimbursable basis for operational requirements, including for technical cooperation activities to avoid

disruption of the activities carried out under the Basel Convention that would result from delays in payment by the Parties of their pledged contributions.

15. Takes note of the recommendation by the Executive Director of UNEP to channel all funding related to the implementation of the Convention through one, consolidated Trust Fund.

16. Notes with appreciation the agreement by the Executive Director of UNEP to extend the two Trust Funds to the Basel Convention for 1999-2000 and 2001-2002 and *mutatis mutandis* the Terms of Reference for their administration as adopted by the First Meeting of the Conference of the Parties (Annex II to decision I/7), and to ensure ex-post-facto approval of the UNEP Governing Council for these extensions according to paragraph 19 of the Terms of Reference, subject to the further development of the Memorandum of Understanding.

17. Further notes that the Executive Director of UNEP will provide the Bureau with a report on the implementation of paragraph 16 of the Terms of Reference of the Trust Funds for the Basel Convention by May for every previous year to ensure the transparency of the use of funds of the Contracting Parties and with the annual certified accounts for the year and a report of activities under the Convention as required by paragraph 17 of the Terms of Reference.

18. Invites the Executive Director of UNEP to consult with the Secretary General of the United Nations on the procedures to be followed to modify the decision of the UN General Assembly regarding the 13 per cent charged to earmarked contributions and consequently not making any overhead charges on expenditures in the Trust Fund for Technical Assistance to Developing Countries.

19. Requests the Secretariat of the Basel Convention to ensure the implementation of all decisions adopted by the third meeting of the Conference of the Parties within the approved budgets for 1996 and for 1997/1998, ensuring that the only limiting factors in the implementation of the decision would be the availability of financial resources in the Trust Funds.

III. Procedural arrangements

20. Reiterates its previous requests to the Secretariat to secure the lowest possible costs for the translation, reproduction and dispatch of the documents for the meetings of the Conference of the Parties and its subsidiary bodies.

21. Decides that the fourth meeting of the Conference of the Parties will be held in September/October 1997.

Annex

A. INSTITUTIONAL AND LEGAL WORKING GROUP - PRIORITIZED DECISIONS

1. The Group has considered the draft decisions offered to it, and has prioritized those which have budgetary implications.

2. The Group notes that many of the decisions are interrelated, and that work under one decision could contribute to the development of other work.

3. The Group felt that the subject of the decisions are self explanatory and therefore there is no need to make further comments.

PRIORITIZED LIST

Priority/ Subject	Draft Decision

1	Liability and Compensation	III/1
2	Illegal Traffic in Hazardous Wastes and other Wastes	III/4
3	Model National Legislation for the Transboundary Movements and Management of Hazardous Wastes	III/5
4	Emergency Fund	III/2
5	Monitoring the Implementation of and Compliance with the Obligations set out by the Basel Convention	III/10
6	The Role of the Secretariat of the Basel Convention in the Implementation of Agenda 21	III/21
7	Cooperation with the International Atomic Energy Agency	III/22
8	Relationship of the Basel Convention and the London Convention, 1972	III/23
9	Evaluation of the Effectiveness of the Basel Convention	III/9
10	Bilateral, Multilateral and Regional Agreements or Arrangements	III/8
11	Manual for the Implementation of the Convention	III/7

B. TECHNICAL WORKING GROUP - PRIORITIZED DECISIONS

1. The Group has considered the draft decisions offered to it, and has prioritized those which have budgetary implications.

2. The Group notes that many of the decisions are interrelated, and that work under one decision could contribute to the development of other work.

3. The Group also notes that some projects can be broken down into a preliminary phase costing relatively little, and an implementation phase where the bulk of expenditure lies.

4. For this reason, the Group would encourage the Secretariat to remain active in all decisions, even those of lower priority, when modest expenditures can pave the way for more efficient work later. Projects for which this approach is particularly relevant have been identified on the prioritized list.

5. The Group is not, of course, in a position to judge its priorities against those of other groups. This should be done by a body with a broader remit then either the Technical Group or the Institutional and Legal Working Group. But the Technical Working Group does note that, in Plenary, delegations have emphasized the particular importance of the work of the Technical Working Group of the Basel Convention.

PRIORITIZED LIST

Priority/	Task	Decision	Comments
1	Hazard characteristics	III/12	Regarded as of particular importance by many delegations
2	Regional centres	III/19	Similarly important, although the Group noted that there was scope here for considerable savings if funded from individual voluntary contributions
3	Documents	III/16	Vital to the proper enforcement of the Convention
4	Liaison	III/24, 25, 26	The Secretariat of the Basel Convention must keep closely in touch with other bodies to avoid unnecessary duplication
5	Training and Seminars	III/20	Some of the training work will be undertaken by the Regional Centres. That element should be a component of priority 2 (dec. III/19)
6	Technical Guidelines	III/13	If the main work has to be deferred because of budgetary constraints, SBC should do what low-cost preparative work it can to allow speedy resumption of the work in a future year
7	Recovery operations	III/14	SBC should at least publish these technical guidelines and explore the possibility of carrying forward the case studies by individual voluntary contributions
8	Transmission of information	III/17	The basic collection and release of statistics can be carried out at low cost. The main cost component here is to develop more advanced information, and it could be deferred, although there may be scope here for direct assistance from Parties
9	Information management system	III/18	A low-cost feasibility study should be carried out at an early stage, but the implementation of the system (the bulk of the cost) could be delayed until funds are available.

APPENDIX (DECISION III/5)

CONFIRMED ILLEGAL TRAFFIC REPORT FORM[19]

PART A: GENERAL INFORMATION

IDENTIFICATION OF THE TRANSMITTER OF INFORMATION

STATE □ IMPORTING □ EXPORTING □ TRANSIT □

ADDRESS:

TEL:

FAX:

DESCRIPTION OF THE ILLEGAL ACT:

TRANSBOUNDARY MOVEMENT OF HAZARDOUS WASTES OR OTHER WASTES:

WITHOUT NOTIFICATION TO: IMPORTING STATE □
TRANSIT STATE □ PARTY □ NON-PARTY □

WITHOUT THE CONSENT OF: IMPORTING STATE □ TRANSIT STATE PARTY □

WITH CONSENT OBTAINED THROUGH FALSIFICATION, MISREPRESENTATION OR FRAUD FROM:

IMPORTING STATE □ TRANSIT STATE PARTY □

THAT DOES NOT CONFORM IN A MATERIAL WAY WITH THE DOCUMENTS: □

THAT RESULTS IN DELIBERATE DISPOSAL OF HAZARDOUS WASTES OR OTHER WASTES IN CONTRAVENTION OF:

BASEL CONVENTION: YES □ NO □

GENERAL PRINCIPLES OF INTERNATIONAL LAW: YES □ NO □

WHICH:

[19] As part of the implementation of Decision II/4 on Illegal Traffic, the Secretariat was requested to establish a "well-defined reporting system on cases of illegal traffic".

PERMISSION FOR EXPORT:

HAS PERMISSION FOR EXPORT BEEN GRANTED BY THE EXPORTING STATE
WITHOUT WRITTEN CONFIRMATION THAT :

THE NOTIFIER HAS RECEIVED THE WRITTEN CONSENT OF THE STATE OF IMPORT:
YES □ NO □

THE NOTIFIER HAS RECEIVED FROM THE STATE OF IMPORT CONFIRMATION OF THE EXISTENCE OF A CONTRACT BETWEEN THE EXPORTER AND THE DISPOSER SPECIFYING ENVIRONMENTALLY SOUND MANAGEMENT OF THE WASTES:
YES □ NO □

THE NOTIFIER HAS RECEIVED THE WRITTEN CONSENT OF THE STATE OF TRANSIT PARTY TO THE CONVENTION:
YES □ NO □

INFORMATION RELATED TO THE HAZARDOUS WASTES OR OTHER WASTES:

GENERAL DESCRIPTION OF THE WASTE:

QUANTITY:

PLACE AND DATE OF DISCOVERY:

MEANS OF TRANSPORT:

SAMPLES TAKEN: YES □ NO □

SAMPLES ANALYZED: YES □ NO □

RESULT:

OTHER TECHNICAL INFORMATION AVAILABLE?: YES □ NO □

{IF YES, PLEASE FILL THE ANNEX}

ACTORS INVOLVED IN THE ILLEGAL TRAFFIC (e.g: Exporter, Importer, Carrier, Generator, Disposer) :

EXPORTING STATE:	**TRANSIT STATE (S):**	**IMPORTING STATE:**
COMPANY (IES):		
ADDRESS:	ADDRESS:	ADDRESS:
COMPANY (IES):		
ADDRESS:	ADDRESS:	ADDRESS:
TEL:	TEL:	TEL:
FAX:	FAX:	FAX:
PERSON:		
ADDRESS:	ADDRESS:	ADDRESS.
TEL:	TEL:	TEL:
FAX:	FAX:	FAX:

PART B: INFORMATION RELATED TO EXPORT/IMPORT/TRANSIT

STATE OF EXPORT:

WAS ILLEGAL TRAFFIC DETECTED BY THE STATE OF EXPORT?: YES □ NO □

BEFORE LEAVING ITS NATIONAL TERRITORY: YES □ NO □

REMEDIAL ACTIONS UNDERTAKEN:

AFTER LEAVING ITS NATIONAL TERRITORY: YES □ NO □

HAS THE EXPORTING STATE INFORMED:

EXPECTED STATE OF IMPORT: YES □ NO □

EXPECTED STATE OF TRANSIT: YES □ NO □

INTERPOL: YES □ NO □

OTHER REGIONAL CONVENTION OR COMMISSION:

YES □ NO □

WHICH:

WAS ANY REMEDIAL ACTION UNDERTAKEN BY STATE OF EXPORT?:

YES □ NO □

WERE THE WASTES TAKEN BACK? : YES □ NO □

IF NO, WHY?:

BY THE GENERATOR □ BY THE EXPORTER □ BY THE EXPORTING STATE □

DATE OF RE-IMPORT:

MEANS OF RE-IMPORT:

WERE THE WASTES DISPOSED OF IN ACCORDANCE WITH BASEL CONVENTION?: YES □ NO □

DESCRIPTION OF WAYS AND MEANS:

OTHER REMEDIAL ACTION(S): YES □ NO □

IF YES, SPECIFY:

<u>STATE OF IMPORT:</u>

IN THE CASE THAT ILLEGAL TRAFFIC IS A RESULT OF CONDUCT ON THE PART OF THE EXPORTER OR GENERATOR:

HAS IMPORTING STATE BEEN INFORMED OF THE ILLEGAL TRAFFIC?

BEFORE ARRIVAL?: BY EXPORTING STATE: YES □ NO □

BY TRANSIT STATE: YES □ NO □

AFTER ARRIVAL?: BY EXPORTING STATE: YES □ NO □

BY TRANSIT STATE: YES □ NO □

HAS THE EXPORTING STATE BEEN INFORMED OF THE ILLEGAL TRAFFIC BY THE IMPORTING STATE?: YES □ NO □

HAS THE EXPORTING STATE REPLIED?: YES □ NO □

HAS EXPORTING STATE IDENTIFIED THE EXPORTER OR GENERATOR?: YES □ NO □

HAS THE RE-IMPORT TO EXPORTING STATE ALREADY BEEN MADE?: YES □ NO □

HAS THE REQUEST TO RE-IMPORT TAKEN PLACE?: YES □ NO □

IF NOT, WHY?:

HAS ANY OTHER REMEDIAL ACTION BEEN TAKEN BY THE EXPORTING STATE?: YES □ NO □

IF YES, SPECIFY:

HAS INTERPOL BEEN INFORMED OF THE ILLEGAL TRAFFIC?: YES □ NO □

IN THE CASE THAT ILLEGAL TRAFFIC IS A RESULT OF CONDUCT ON THE PART OF THE IMPORTER OR DISPOSER:

HAS REMEDIAL ACTION BEEN TAKEN BY THE STATE OF IMPORT?: YES □ NO □

IF YES, SPECIFY:

WERE THE WASTES DISPOSED OF IN ACCORDANCE WITH THE BASEL CONVENTION?: YES □ NO □

DESCRIPTION OF WAYS AND MEANS:

STATE OF TRANSIT:

ILLEGAL TRAFFIC DETECTED BY THE STATE OF TRANSIT: YES □ NO □

BEFORE THE WASTES LEFT ITS NATIONAL TERRITORY?: YES □ NO □

REMEDIAL ACTION UNDERTAKEN: YES □ NO □

HAS TRANSIT STATE INFORMED:

THE EXPORTING STATE: YES □ NO □

INTERPOL: YES □ NO □

OTHER REGIONAL CONVENTION OR COMMISSION: YES □ NO □

WHICH:

AFTER THE WASTES LEFT ITS NATIONAL TERRITORY?: YES □ NO □

HAS THE TRANSIT STATE INFORMED:

THE EXPECTED STATE OF IMPORT: YES □ NO □

OTHER EXPECTED STATE OF TRANSIT: YES □ NO □

INTERPOL: YES □ NO □

OTHER REGIONAL CONVENTION OR COMMISSION: YES □ NO □

WHICH:

PUNISHMENT:

IS THE ILLEGAL TRAFFIC CONSIDERED A CRIMINAL ACT BY THE NATIONAL LEGISLATION OF?:

EXPORTING STATE:		IMPORTING STATE:		TRANSIT STATE:	
YES □	NO □	YES □	NO □	YES □	NO □

PUNISHMENT IMPOSED BY:

EXPORTING STATE □ IMPORTING STATE □ TRANSIT STATE □

IDENTIFICATION OF THE PERSON(S) PUNISHED:

PUNISHMENT ALREADY EXECUTED: YES □ NO □

TYPE OF PUNISHMENT:

COMMUNICATION OF PUNISHMENT TO THE:

EXPORTING STATE □ IMPORTING STATE □ TRANSIT STATE □

Annex

1. PLACE AND DATE OF DISCOVERY:

HYDROGEOLOGICAL CONDITIONS:	YES □	NO □
HUMAN SETTLEMENT AREAS:	YES □	NO □
INDUSTRIAL ZONES:	YES □	NO □
COASTAL AREAS:	YES □	NO □
FORESTS:	YES □	NO □
AGRICULTURE AREAS:	YES □	NO □
RIVERSIDES:	YES □	NO □
OTHER (PLEASE SPECIFY):		

2. GENERAL DESCRIPTION OF THE WASTES:

COMPOSITION: PURE:		YES □	NO □
	MIXED:	YES □	NO □
	SOLID:	YES □	NO □
	LIQUID:	YES □	NO □
	ORGANIC:	YES □	NO □
	INORGANIC	YES □	NO □

PHYSICO-CHEMICAL PROPERTIES/CHARACTERISTICS:
CLASSIFICATION IN BASEL CONVENTION:

EXPLOSIVE:	YES □	NO □
FLAMMABLE LIQUIDS:	YES □	NO □
FLAMMABLE SOLIDS:	YES □	NO □
OXIDING:	YES □	NO □
ORGANIC PEROXIDES:	YES □	NO □
POISONOUS:	YES □	NO □
INFECTIOUS SUBSTANCES:	YES □	NO □
CORROSIVE:	YES □	NO □
TOXIC:	YES □	NO □
ECOTOXIC:	YES □	NO □

SUBSTANCES OR WASTES LIABLE TO SPONTANEOUS COMBUSTION: YES □ NO □

SUBSTANCES OF WASTES WHICH, IN CONTACT WITH WATER EMIT FLAMMABLE GASES: YES □ NO □

LIBERATION OF TOXIC GASES IN CONTACT WITH AIR OR WATER: YES □ NO □

3. MODES OF TRANSPORT:

PACKAGING: YES □ NO □

IF YES, PLEASE SPECIFY:

LABELLING: YES □ NO □

4. TESTING:

SAMPLES TAKEN:
SAMPLES ANALYZED:
RESULTS:

5. CONTAINMENT APPEARANCE:

LEAKAGES OBSERVED: YES □ NO □
EMISSIONS DETECTED: YES □ NO □
ODOURS DETECTED: YES □ NO □
OTHER:
DETAILS OF OBSERVATION MADE:

MEASURES TAKEN: YES □ NO □
IF NO, EXPLAIN WHY:

6. OCCURRENCE OF DAMAGES TO:

POPULATION: YES □ NO □
PROPERTIES: YES □ NO □
ENVIRONMENTAL MEDIAS: YES □ NO □
IF KNOWN, PLEASE QUALIFY MEDIA

DECISIONS ADOPTED BY
THE FOURTH MEETING
OF THE CONFERENCE OF THE PARTIES

in Kuching, Malaysia
on 27 February 1998

IV/1. BILATERAL, MULTILATERAL AND REGIONAL AGREEMENTS OR ARRANGEMENTS

The Conference

1. Takes note of the information provided by the Parties on the conformity of their bilateral, multilateral and regional agreements or arrangements with Article 11 of the Basel Convention, taking into account the list of questions annexed to decision II/10 of the second meeting of the Conference of the Parties;

2. Requests the Parties that have entered, in accordance with Article 11, into bilateral, multilateral and regional agreements or arrangements and that have not yet reported on the conformity of such agreements or arrangements with the said Article, to report through the Secretariat to the next session of the Open-ended Ad Hoc Committee, taking into account the list of questions annexed to decision II/10;

3. Requests the Secretariat of the Basel Convention to establish and update a list of bilateral, multilateral and regional agreements or arrangements in effect, reported to the Secretariat, and to distribute this list on a regular basis to Parties and non-Parties.

IV/2. GUIDANCE ELEMENTS FOR BILATERAL, MULTILATERAL AND REGIONAL AGREEMENTS OR ARRANGEMENTS

The Conference

1. Takes note of the draft guidance elements developed by the Technical Working Group;

2. Extends the mandate of its Technical Working Group and gives a mandate to the Consultative Sub-group of Legal and Technical Experts and requests these two groups to cooperate closely on this subject with a view:

   (a) To further elaborating on the text of the draft guidance elements;

   (b) To presenting to the next meeting of the Open-ended Ad Hoc Committee the revised draft elements for adoption by the fifth meeting of the Conference of the Parties;

3. Encourages Parties and States non-parties to refer to the draft guidance elements when considering bilateral, multilateral or regional agreements or arrangements.

IV/3. TRANSMISSION OF INFORMATION

The Conference

1. Takes note of the report prepared by the Secretariat on the implementation of Articles 13 and 16;

2. Acknowledges the efforts made by Parties to provide information to the Secretariat of the Basel Convention for the calendar years 1994 and 1995;

3. Invites those Parties that have not yet done so to report on Articles 13 and 16 for the calendar year 1996 as soon as possible, using the questionnaire prepared for this purpose by the Secretariat and bearing in mind that, according to the provisions of Article 13, Parties are requested to transmit, before the end of each calendar year, a report on information for the previous calendar year;

4. Requests the Parties to provide such information to the Secretariat for the calendar year 1997, before the end of calendar year 1998;

5. Requests Parties to comment upon and propose improvements to the existing format of the questionnaire in order to enable the Secretariat to revise it in time for reporting by Parties on 1996 activities;

6. Requests the Secretariat to continue its efforts in promoting the harmonizing of the reporting system of other organizations and to initiate action on this matter with relevant agencies.

IV/4. ESTABLISHMENT OF REGIONAL OR SUBREGIONAL CENTRES FOR TRAINING AND TECHNOLOGY TRANSFER REGARDING THE MANAGEMENT OF HAZARDOUS WASTES AND OTHER WASTES AND THE MINIMIZATION OF THEIR GENERATION

The Conference

1. Takes note of the progress in the establishment of regional and subregional centres for training and technology transfer and of the existing and proposed organizational arrangements, as well as of the funding situation of the respective centres;

2. Welcomes the financial support provided by the Government of Switzerland for the establishment and initiation of activities at the Regional Centre in Bratislava for Central and Eastern Europe for a two-year period and the contribution in kind (staff, logistics, utilities, administrative and organizational arrangements) provided by the Government of Slovakia;

3. Welcomes the financial support provided by:

   (a) The Government of Canada, for the initiation of the activities at the Coordinating Centre in Uruguay;

   (b) The Government of Germany (GTZ) for the undertaking of a feasibility study for the establishment of a subregional centre for English-speaking countries in Africa;

   (c) The United Nations Environment Programme, through its Swedish Technical Cooperation Trust Fund, for the undertaking of feasibility studies for the establishment of subregional centres for Arabic-speaking and French-speaking African countries;

(d) The Government of Australia, for the holding of a regional meeting in China to discuss the outcome of the feasibility study for the establishment of centres in the Asia and Pacific region and for support to a second meeting in this region to be held in Indonesia to agree on arrangements and activities in the Indonesian Regional Centre as well as its interaction and relation with other centres in the region;

4. Takes note of the fact that the contribution in kind for core activities of the Centre by the host Government (Slovakia), in addition to the contribution by the Government of Switzerland, facilitated and speeded up the initiation of activities at the Centre for Central and Eastern Europe;

5. Further takes note of the efforts made by other host countries to provide in-kind contributions for the establishment and activities of the centres;

6. Recommends that, as far as possible, the same approach be adopted by host Governments in all regions for the regional and subregional centres, by providing for the core staff and activities of the centres as a contribution in kind;

7. Requests the Secretariat of the Basel Convention to continue to explore areas of cooperation with other international conventions and agencies of the United Nations system on sustainable development in the question of the establishment of regional technology centres and encourages networking to maximize interlinkages, and to avoid duplication of efforts;

8. Also requests the Secretariat to collaborate with the Regional Organization for Protection of the Marine Environment (ROPME) for the Gulf region, located in Kuwait, as well as with the Regional Office for West Asia of the United Nations Environment Programme, in relation to the provision of training and technology transfer in the environmentally sound management of hazardous wastes and the transboundary movement of such wastes for the countries in the ROPME sea region;

9. Urges all Parties and non-Parties in a position to do so, as well as international organizations, including development banks, non-governmental organizations and the private sector, including industry, to make financial or in-kind contributions to allow all centres to become operational as soon as possible and to support their activities;

10. Urges the Parties to have as a goal the long-term sustainability of the centres and to ensure that various options are being thoroughly considered in order to achieve this goal;

11. Urges all designated host Governments, as soon as regional and subregional meetings have been held to discuss the outcome of the feasibility studies, to prepare concrete project proposals for the establishment of their respective centres, with detailed budgets to be sent to donors for funding and with feasible action plans for the centres to become financially self-sufficient within a specific time-frame;

12. Requests the Secretariat to convene regional and subregional meetings to discuss the outcome of the feasibility studies not yet addressed by such meetings, in order to accelerate the establishment of centres in those regions;

13. Further urges Parties, especially those which are future hosts of regional and subregional centres, to include the above project proposals as priority activities in their development plans, in order to enable donor agencies to consider providing financial support in connection with the regularly organized United Nations Development Programme round-table donors' meetings;

14. Requests the Secretariat to continue to report to future sessions of the Open-ended Ad Hoc Committee on progress made in the establishment of regional centres on training and technology

transfer.

IV/5. REPORT OF THE CONTRACTING PARTIES AND SIGNATORIES ON THE IMPLEMENTATION OF DECISION II/12

The Conference

1. Takes note of the report prepared by the Secretariat of the Basel Convention on the implementation of decision II/12;

2. Requests the Parties which have not yet reported to the Secretariat on the implementation of decision II/12 to do so as soon as possible, to allow for the presentation of a comprehensive report to the next meeting of the Conference of the Parties;

3. Requests the Secretariat to consolidate the report, including the information received on the implementation of this decision in previous years;

4. Requests the Open-ended Ad Hoc Committee to present a further consolidated report to the fifth meeting of the Conference of the Parties.

IV/6. OUTCOME OF THE WORK OF THE TECHNICAL WORKING GROUP ON LISTS OF WASTES AND THE APPLICABLE PROCEDURE FOR THEIR REVIEW OR ADJUSTMENT

The Conference

1. Notes with appreciation the efforts of the Technical Working Group in preparing the List A and List B of wastes;

2. Considers the draft Position Paper together with the consolidated Lists A and B of wastes, and the applicable procedure for reviewing or adjusting List A and List B;

3. Agrees to approve the draft Position Paper on Hazard Characterization and Classification of Wastes within the Framework of the Basel Convention as contained in document UNEP/CHW.4/2;

4. Approves the List A and List B of wastes as submitted by the Technical Working Group;

5. Approves the Application Form for the Placement or Removal of Wastes on List A or List B developed by the Technical Working Group;

6. Extends the mandate of the Technical Working Group and instructs the Technical Working Group to keep the List A and List B of wastes under review using the Application Form for placement or removal of wastes on these Lists for this purpose;

7. Requests the Technical Working Group to provide the Conference of the Parties with recommendations on the revision or adjustment of List A and List B of wastes;

8. Notes the wastes placed on List C;

9. Instructs the Technical Working Group to review wastes on List C with a view to their placement on List A or List B;

10. Also instructs the Technical Working Group to initiate work on wastes about which particular

concerns are or have been expressed;

11. Instructs the Technical Working Group to develop the procedure for reviewing or adjusting the lists of wastes and to submit a proposal for approval at the fifth meeting of the Conference of the Parties;

12. Requests the Technical Working Group to continue its work on the hazard characterization of wastes, in particular, for the hazard characteristics H6.2, H10, H11, H12 and H13 of Annex III to the Convention;

13. Requests the Secretariat to publish the draft position paper, in the official languages of the United Nations, and to disseminate it to Parties, signatories of the Convention, other States, intergovernmental organizations, industry and business, as well as to environmental non-governmental organizations;

14. Requests the Secretariat of the Basel Convention to ensure that the outcome of the work of the Technical Working Group be made available to Parties on a regular basis.

IV/7. IMPLEMENTATION OF DECISION III/1

The Conference

1. Takes note of the progress made by Parties in effectively implementing decision III/1;

2. Welcomes the ratification by several countries of the Amendment adopted by decision III/1;

3. Strongly appeals to Parties to ratify the Amendment adopted by decision III/1 as soon as possible to enable the early entry into force of the Amendment.

IV/8. DECISION REGARDING ANNEX VII

The Conference

Affirming the objectives set out in decision III/1,

Noting that the amendment contained in decision III/1 has not yet come into force, and therefore also noting decision IV/7 of this Conference, which urges Parties to ratify this Amendment as a matter of priority,

Further noting the deep concern of Arab and other countries of making any changes to Annex VII,

Reaffirming the importance of the broad ratification and entry into force of the amendment contained in decision III/1 and recognizing the difficulties of modifying Annex VII prior to the entry into force of that amendment,

Further noting the proposals formulated by Parties for inclusion into Annex VII,

1. Decides to leave Annex VII unchanged until the amendment contained in decision III/1 enters into force;

2. Further decides to explore issues relating to Annex VII and requests the Technical Working Group in cooperation with the Sub-group of Legal and Technical Experts to provide Parties with a detailed and documented analysis that would highlight issues related to Annex VII;

3. Requests those two Groups to report to the fifth meeting of the Conference of the Parties;

4. Confirms that the work to be undertaken is without prejudice to any future decisions concerning Annex VII.

IV/9. AMENDMENT AND ADOPTION OF ANNEXES TO THE CONVENTION

The Conference

Recalling decision III/1 of the Conference of the Parties, which instructed the Technical Working Group, among other things, to give full priority to completing the work on hazard characterization and the development of lists, in order to submit them for approval to the fourth meeting of the Conference of the Parties,

Recalling decision III/12 of the Conference of the Parties, which instructed the Technical Working Group, among other things, to consider ways of taking forward the development of lists of hazardous wastes and the applicable procedure for their review based on the outcome of the work of the Technical Working Group, as well as further developing lists of wastes not covered by this Convention,

Taking note of the work carried out by the Technical Working Group and in particular the development of a list of wastes that are characterized as hazardous pursuant to Article 1, paragraph 1 (a), (list A contained in the note on consolidated lists of wastes and the applicable procedures for their review and adjustment (UNEP/CHW.4/3)) and a list of wastes that are not covered by article 1, paragraph 1 (a), of this Convention (list B contained in the note on consolidated lists of wastes and the applicable procedures for their review and adjustment), as well as the progress made in the development of a procedure for reviewing or adjusting these lists and of an application form required for the placement or removal of wastes on these lists,

Considering that Annex I and Annex III shall remain the factors to characterize wastes as hazardous for the purpose of this Convention, that lists A and B developed by the Technical Working Group provide an expeditious way to facilitate the implementation of this Convention, including Article 4A, by establishing wastes that are and wastes that are not covered by Article 1, paragraph 1 (a), of this Convention, and that these lists should have equal status,

Noting that wastes listed in lists A and B are an elaboration and clarification of the provisions of Article 1, paragraph 1 (a), of this Convention by reference to Annexes I and III,

Recognizing that List A and List B are not intended to be exhaustive,

Taking note that the Open-ended Ad Hoc Committee decided at its third meeting to propose that the Conference of the Parties extend the mandate of the Technical Working Group to take charge of the procedure for reviewing or adjusting the lists of wastes and that the Conference of the Parties adopt the application form for this purpose, as set out in the note on consolidated lists of wastes and the applicable procedures for their review and adjustment,

Taking note that, pursuant to decision IV/6, the Technical Working Group is instructed to keep the lists of wastes under review and to make recommendations to the Conference of the Parties for revisions or adjustments,

Further taking note that, pursuant to decision IV/6, the Technical Working Group is instructed to review the procedure for reviewing or adjusting the lists of wastes, including the Application Form as set out in the note on consolidated lists of wastes and the applicable procedures for their review and adjustment and to submit a proposal for approval at the fifth meeting of the Conference of the Parties,

Decides to adopt the following amendment and adoption of annexes to this Convention:

1. Add the following paragraphs at the end of Annex I:

(a) To facilitate the application of this Convention, and subject to paragraphs (b), (c) and (d), wastes listed in Annex VIII are characterized as hazardous pursuant to Article 1, paragraph 1 (a), of this Convention, and wastes listed in Annex IX are not covered by Article 1, paragraph 1 (a), of this Convention.

(b) Designation of a waste on Annex VIII does not preclude, in a particular case, the use of Annex III to demonstrate that a waste is not hazardous pursuant to Article 1, paragraph 1 (a), of this Convention.

(c) Designation of a waste on Annex IX does not preclude, in a particular case, characterization of such a waste as hazardous pursuant to Article 1, paragraph 1 (a), of this Convention if it contains Annex I material to an extent causing it to exhibit an Annex III characteristic.

(d) Annexes VIII and IX do not affect the application of Article 1, paragraph 1 (a), of this Convention for the purpose of characterization of wastes.

2. Add the following two new annexes to the Convention as its Annexes VIII and IX. [Please see pages 36-50 of the text of the Convention]

IV/10. TRAINING AND SEMINARS RELATED TO THE BASEL CONVENTION

The Conference

1. Requests the Secretariat of the Basel Convention to continue developing training programmes, including curricula at national level, in cooperation with national authorities and organizing national and regional training activities on the implementation of the Basel Convention in collaboration with the United Nations Environment Programme and other international organizations as well as the private sector and environmental non-governmental organizations;

2. Further requests the Secretariat, in collaboration with the United Nations Environment Programme and other international organizations as well as the private sector and environmental non-governmental organizations, actively to contribute to the implementation of the programme of activities of the regional centres by developing training materials, publications and other supporting materials, by facilitating the development of local and regional activities and case studies and by providing resource persons for training courses;

3. Also requests the Secretariat of the Basel Convention to continue promoting public awareness on the aims of the Basel Convention through participation in related international conferences, symposia and seminars, through the preparation and publication of brochures, newsletters, leaflets, press releases, case studies and other publications and material in this field, and through the consolidation of the websites of the Basel Convention on the Internet;

4. Urges Parties to contribute to the voluntary Technical Cooperation Trust Fund established under the Basel Convention with the aim to support the activities of developing countries and the Secretariat of the Basel Convention in developing training and capacity-building activities as well as awareness-raising activities;

5. Invites all Parties which are in a position to do so to contribute to the trust funds to cover the costs of participation of developing country representatives at meetings and seminars organized

by the Secretariat, or in kind, through, inter alia, the provision of resource persons for the organization of seminars, workshops and training programmes.

IV/11. CURRENT AND PLANNED TECHNICAL ASSISTANCE ACTIVITIES INCLUDING FOR THE IMPLEMENTATION OF AGENDA 21

The Conference

1. Takes note of the report prepared by the Secretariat of the Basel Convention;

2. Requests the Secretariat to continue to provide assistance within the limits of its existing financial resources;

3. Urges Parties and other countries to provide assistance on a bilateral or regional basis or through the Secretariat;

4. Urges Parties to cooperate actively on a regional basis, in particular for those Parties that have the capacity to provide technical support to other countries of the region in need of such assistance;

5. Requests the Secretariat to make available to Parties the updated list of technical assistance needed on a regular basis.

IV/12. ILLEGAL TRAFFIC IN HAZARDOUS WASTES AND OTHER WASTES

The Conference

1. Welcomes the work of the Technical Working Group on confirmed cases of illegal traffic and recognizes that the issue of illegal traffic remains a high priority with particular emphasis on cases involving alleged illegal traffic;

   (a) Appeals to Parties to bring any case or, if appropriate, alleged case of illegal traffic to the attention of the Secretariat and to provide the Secretariat with all necessary information to enable it to take any appropriate action, including preventive measures through initial dissemination of information to Parties concerned;

   (b) Welcomes steps taken by Parties to submit information on how Parties may have dealt with illegal traffic, including alleged cases of illegal traffic, with regard to difficulties they could be facing when seeking compliance with the provisions of the Basel Convention;

   (c) Recognizes that illegal traffic can take many different forms and be of different magnitudes ranging from, for example, falsification of documents to large-scale organized activities;

   (d) Requests Parties to cooperate with each other and the Secretariat on alleged cases of illegal traffic;

   (e) Assigns the Consultative Sub-group of Legal and Technical Experts the task of developing procedures to address alleged cases of illegal traffic;

   (f) Adopts the draft Form for Confirmed Cases of Illegal Traffic for use by Parties in confirmed cases of illegal traffic;

   (g) Invites Parties to use this form in their reports related to confirmed cases of illegal traffic

to the Secretariat;

(h) Requests the Secretariat to report to the fifth meeting of the Conference of the Parties, through the Open-ended Ad Hoc Committee for the Implementation of the Basel Convention, as appropriate, on information received by Parties on cases of illegal traffic;

2. Welcomes the convening of meetings and conferences on the prevention of illegal traffic approved by decision III/28 and urges Parties to promote the effective participation of developing countries in these meetings;

3. Urges Parties to fulfil their obligations under Article 9, paragraph 5 of the Basel Convention, in particular:

(a) To promulgate, update and/or develop stringent legislation on the control of transboundary movements of hazardous wastes;

(b) To incorporate in their national legislation appropriate sanctions or penalties for illegal traffic in hazardous wastes and other wastes covered by the Basel Convention;

4. (a) Notes that the classification and characterization of wastes represent essential tools to assist in the identification and prevention of illegal traffic;

(b) Requests the Secretariat of the Basel Convention, bearing in mind decisions I/18 and II/23, to work closely with the United Nations Committee of Experts on the Transport of Dangerous Goods towards the development of an appropriate classification and labelling system;

(c) Requests the Secretariat to continue its cooperation with various regional commissions and secretariats of regional conventions and protocols, non-governmental organizations, industry and the private sector, as well as the World Customs Organization and Interpol, in order to achieve better control and monitoring of cases or alleged cases of illegal traffic in hazardous wastes and other wastes;

(d) Requests the Secretariat to organize training courses for customs officers and police forces in cooperation with the World Customs Organization, Interpol and other appropriate bodies, including United Nations regional commissions and secretariats of regional agreements dealing with similar aspects;

(e) Requests the Secretariat to assist Parties in capacity building, including the development of an appropriate infrastructure, with a view to preventing and penalizing cases of illegal traffic in hazardous wastes and other wastes and to ensuring the involvement of national authorities and focal points for the Basel Convention in the prevention and monitoring of illegal traffic in hazardous wastes and other wastes;

(f) Encourages Parties to build up their enforcement capacities, inter alia, through cooperation with international bodies such as Interpol and the International Network for Environmental Complaints, in the development of training and networking for enforcement personnel involved in the prevention of illegal traffic;

(g) Invites Parties to promote consistency when addressing the issue of illegal traffic in the relevant United Nations bodies, while avoiding duplication;

5. Requests the Technical Working Group and the Consultative Sub-group of Legal and Technical Experts, at their joint meeting, keeping in mind the discussions within the Ad Hoc Working Group of Legal and Technical Experts to Consider and Develop a Draft Protocol on Liability and Compensation, to develop recommended procedures to assist Parties in preventing, identifying

and managing illegal traffic.

IV/13. COMPETENT AUTHORITIES AND FOCAL POINTS

The Conference

1. Takes note of the updated list of competent authorities and focal points prepared by the Secretariat of the Basel Convention;

2. Invites Parties which have not yet informed the Secretariat of the designation of their Competent Authorities and Focal Points to do so as soon as possible to facilitate the implementation of the Basel Convention.

IV/14. INSTRUCTION MANUAL

The Conference

1. Takes note of the revised Instruction Manual on the control system for transboundary movements of hazardous wastes and other wastes;

2. Welcomes the technical assistance provided by Finland in the preparation of the Instruction Manual;

3. Approves the Instruction Manual and its accompanying Notification and Movement Document;

4. Requests the Secretariat of the Basel Convention to publish the Instruction Manual in all United Nations languages and to disseminate it widely;

5. Invites Parties to use the Instruction Manual and the forms contained therein and report to the Secretariat on their experience in the use of the Instruction Manual and the forms, in particular in cases where difficulties occur in their use.

IV/15. ESTABLISHMENT OF AN INFORMATION MANAGEMENT SYSTEM ON WASTES (IMSW) OF THE BASEL CONVENTION

The Conference

1. Takes note of progress reported on the establishment and development of an Information Management System on Wastes (IMSW) under the Basel Convention;

2. Welcomes the support from the Government of Japan for the establishment of the IMSW;

3. Also urges the Secretariat of the Basel Convention to develop further and promote access to the IMSW through the Internet, including information and documentation on information received in relation to Articles 13 and 16, as well as documentation on and reports of Basel Convention meetings, newsletters and publications, etc.;

4. Requests the Secretariat to work closely with other United Nations bodies, in particular the United Nations Environment Programme, that are developing or operating databases or information management systems of relevance to the Basel Convention.

IV/16. COOPERATION WITH UNITED NATIONS BODIES, SPECIALIZED AGENCIES AND

The Conference

I. 1. Takes note of the activities undertaken by the Secretariat of the Basel Convention to cooperate with key organizations of the United Nations system, regional conventions and commissions, other conventions and intergovernmental bodies, as well as with non-governmental organizations and the private sector, including industry;

2. Requests the Secretariat further to consolidate its cooperation on critical areas for the implementation of the Basel Convention with relevant United Nations bodies and specialized agencies, including the International Atomic Energy Agency and the United Nations Environment Programme Industry and Environment Centre, other intergovernmental organizations, regional conventions and commissions, as well as with non-governmental organizations and the private sector, including industry;

II. World Customs Organization

1. Takes note of the activities undertaken by the Secretariat of the Basel Convention, under the guidance of the Technical Working Group, to cooperate with the World Customs Organization in identifying hazardous wastes separately in the Harmonized Commodity Description and Coding System;

2. Further takes note that the Harmonized System Committee at its seventeenth session (May 1996) provisionally adopted a number of amendments to the Harmonized System nomenclature concerning separate identification of certain categories of wastes based on proposals of the Secretariat of the Basel Convention, the Organisation for Economic Cooperation and Development and the European Commission. These amendments are expected to come into force on 1 January 2002;

3. Urges the World Customs Organization to accord priority to evolving the Harmonized Commodity Description and Coding System;

4. Also takes note that the deadline established by the Harmonized System Committee for the submission of new proposals for the separate identification of wastes covered by the Basel Convention in the Harmonized System nomenclature for the next Harmonized System amendments, to be implemented as from 1 January 2002, is the end of 1997;

5. Requests the Secretariat under the guidance of the Technical Working Group, and in cooperation with the Organisation for Economic Cooperation and Development as well as with interested Parties, to pursue its cooperation with the World Customs Organization concerning the separate identification of certain categories of hazardous wastes in the Harmonized System nomenclature, in particular to cooperate with the World Customs Organization and the Harmonized System Committee in their eventual examination of the classification of the wastes placed on lists A and B prepared by the Technical Working Group in the Harmonized System nomenclature;

III. Organisation for Economic Cooperation and Development (OECD)

1. Takes note of the cooperation between the Secretariat of the Basel Convention and the OECD Environment Directorate on matters pertaining to the implementation of the Basel Convention;

2. Requests the Secretariat further to cooperate with the OECD Environment Directorate on matters concerning the implementation of the Basel Convention and propose, as appropriate, any arrangement best suited to fulfil this task;

3. Further requests the Secretariat, in close consultation with the Chairperson of the Technical Working Group, to work out implications and the modalities required to aim at achieving compatibility among the different systems dealing with the control of transboundary movements of wastes and hazardous wastes;

4. Also requests its Technical Working Group to ensure close liaison with the OECD Waste Management Policy Group on the matter of harmonization of the OECD and the Basel Convention systems concerning the control of transboundary movements of hazardous wastes, and report on progress to the fifth meeting of the Conference of the Parties.

IV/17. COOPERATION BETWEEN THE BASEL CONVENTION AND THE ACTIVITIES UNDERTAKEN AT THE GLOBAL LEVEL LEADING TO THE DEVELOPMENT OF THE LEGALLY BINDING INSTRUMENTS FOR THE APPLICATION OF THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE AND ON PERSISTENT ORGANIC POLLUTANTS

The Conference

1. Takes note of the activities of the Technical Working Group regarding efforts to ensure that the international legally binding instruments being prepared concerning the implementation of the prior informed consent procedure and on persistent organic pollutants do not overlap with the Basel Convention;

2. Emphasizes that the sets of technical guidelines on wastes comprising or containing PCBs, PCTs, and PBBs and on hazardous waste from the production and use of organic solvents prepared by the Technical Working Group and adopted by the second meeting of the Conference of the Parties are of relevance to the issue of a number of persistent organic pollutants;

3. Requests the Secretariat of the Basel Convention, under the guidance of the Technical Working Group, to continue its cooperation with the United Nations Environment Programme and other relevant intergovernmental organizations, in particular with the Food and Agriculture Organization of the United Nations, the International Maritime Organization, the United Nations Economic Commission for Europe and the World Health Organization, on matters pertaining to coordination among these bodies, with a view to developing legally binding instruments which would not overlap with the Basel Convention;

4. Invites Parties to initiate, as appropriate and if not yet done, consultations with their respective national authorities responsible for chemical management to ensure consistency in regard to the scope of the Basel Convention and the newly developed legally binding instruments on hazardous chemicals;

5. Requests the Technical Working Group to consider the further elaboration of technical guidelines for the environmentally sound management of persistent organic pollutants;

6. Further invites Parties, as appropriate, to consider the particular difficulties posed by persistent organic pollutant wastes when providing technical assistance.

IV/18. HAZARDOUS WASTE MINIMIZATION

The Conference

1. (a) Invites Parties to cooperate in the minimization of the generation of hazardous wastes, in particular through the use of cleaner production methods or technologies;

(b) Further invites Parties that are currently using cleaner production methods or technologies in their industrial processes and product design, to facilitate and cooperate in the transfer of these methods or technologies to other Parties;

(c) Also invites Parties to promote and support such activities within the framework of the establishment and operation of the regional or subregional centres for training and technology transfer regarding the management of hazardous wastes and other wastes and the minimization of their generation;

2. Encourages Parties to work closely with industries in achieving minimization of hazardous wastes;

3. Extends the mandate of the Technical Working Group to pursue its work on the selection of hazardous waste streams susceptible to cleaner production approaches;

4. Requests the Secretariat of the Basel Convention to cooperate with the United Nations Environment Programme Industry and Environment Centre as well as with the Organisation for Economic Cooperation and Development on this matter;

5. Further requests the Secretariat to report on progress to the Conference of the Parties at its fifth meeting, through the Open-ended Ad Hoc Committee as appropriate.

IV/19. AD HOC WORKING GROUP OF LEGAL AND TECHNICAL EXPERTS TO CONSIDER AND DEVELOP A DRAFT PROTOCOL ON LIABILITY AND COMPENSATION FOR DAMAGE RESULTING FROM TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

The Conference

1. Acknowledges the substantive progress made by the Ad Hoc Working Group of Legal and Technical Experts to Consider and Develop a Draft Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal at its fifth session in May 1997;

2. Takes note of its report presented to the Conference of the Parties at its fourth meeting;

3. Acknowledges also the potential implications for the draft Protocol for Liability and Compensation of the development of the Basel Convention, inter alia, its decision III/1, as well as other relevant international conventions;

4. Extends the mandate of the Ad Hoc Working Group;

5. Requests the Ad Hoc Working Group to make all efforts possible to finalize the draft Articles of the Protocol, making use of informal meetings where possible, in order to present it for consideration and adoption by the fifth meeting of the Conference of the Parties

IV/20. EMERGENCY FUND

The Conference

Recalling its decision III/3,

Taking note of the report presented by the Consultative Sub-group of Legal and Technical

Experts on the issues related to establishing an emergency fund, including the elements required for its establishment, at its second session in May 1997,

Requests the Consultative Sub-group to keep these issues on its agenda.

IV/21. MONITORING THE IMPLEMENTATION OF AND COMPLIANCE WITH THE OBLIGATIONS SET OUT BY THE BASEL CONVENTION

The Conference

Recalling its decision III/11,

Taking note of the report presented by the Consultative Sub-group of Legal and Technical Experts at its second session in May 1997 on issues related to monitoring the implementation of and compliance with the obligations set out under the Basel Convention,

Welcoming the steps already taken by requesting information concerning aspects of implementation of the Basel Convention,

1. Requests the Consultative Sub-group to continue its step-by-step approach to examining the relevant issues related to the establishment of a mechanism or procedure for monitoring implementation of and compliance with the Basel Convention with a view to recommending, as soon as practicable, the best way to promote full implementation of the provisions of the Basel Convention, including whether or not such a mechanism or procedure would be required and, to the extent appropriate, what its design might be;

2. Further requests that the Consultative Sub-group examine the dispute settlement mechanism that exists under Article 20 of the Basel Convention, and consider whether it continues to meet the needs of the Parties to the Convention;

3. Requests that the Consultative Sub-group report its findings and recommendations to the fifth meeting of the Conference of the Parties.

IV/22. INSTITUTIONAL, FINANCIAL AND PROCEDURAL ARRANGEMENTS

The Conference

Referring to decision III/28 of the third meeting of the Conference of the Parties,

Having considered the experience of the work of the Extended Bureau and the Secretariat of the Basel Convention during the period between the third and fourth meeting of the Conference of the Parties,

1. Expresses its concern over the delays in payment of the agreed contributions by Parties as well as the voluntary contributions by Parties and non-Parties according to the agreements reached at the first meeting of the Conference of the Parties in accordance with which: "all contributions are due to be paid in the year immediately preceding the year to which the contributions relate";

2. Approves the budget for the Trust Fund for the Implementation of the Basel Convention in the amount of US$ 3,001,854 for 1999 and US$ 3,001,854 for 2000 to be met from the allocated scale of assessments (attached as Annex I to this decision);

3. Recognizes that voluntary contributions are essential to the effective implementation of the

Convention and expects to receive additional voluntary contributions from the signatory(ies) as well as other countries;

4. Notes that, in accordance with the Annex I to this decision, the budget projects significant drawdown on a surplus and requests the Extended Bureau of the Parties to ensure that the surplus in the Trust Fund for the Implementation of the Convention be kept under review of the Extended Bureau;

5. Takes note of the budget for the Technical Cooperation Trust Fund to the amount of US$ 2,647,900 for 1999 and US$ 1,937,900 for 2000 (attached as Annex II to this decision);

6. Invites Parties to notify the Secretariat of the Basel Convention of all contributions made to the Basel Convention Trust Funds at the time such payments are made;

7. Requests the Executive Director of the United Nations Environment Programme to extend the two Trust Funds to the Basel Convention for 2003-2004 and mutatis mutandis the Terms of Reference for their administration as adopted by the first meeting of the Conference of the Parties;

8. Requests the Secretariat of the Basel Convention to ensure the implementation of all decisions adopted by the fourth meeting of the Conference of the Parties within the approved budgets for 1999 and 2000, ensuring that the only limiting factors in the implementation of the decisions would be the availability of financial resources in the Trust Funds;

9. Also requests the Secretariat of the Basel Convention to secure the lowest possible costs for translation, reproduction and dispatch of the documents for the meetings of the Conference of the Parties and its subsidiary bodies;

10. Notes the monies owned by the Trust Fund for the Implementation of the Basel Convention to the United Nations Environment Programme and requests the Executive Director of the United Nations Environment Programme to take into account the budgetary constraints of this Trust Fund in deciding whether and when to recover those monies, after consultation with the Executive Secretary of the Basel Convention;

11. Requests the Executive Secretary of the Basel Convention to report every six months to the Extended Bureau on all sources of income received, including carry-over, plus actual provisional expenditures and commitments; further requests the Executive Secretary to report all expenditures against the agreed budget lines;

12. Requests the Executive Director of the United Nations Environment Programme, in addition to requirements referred to in paragraph 17 of the Terms of Reference for the Administration of the Trust Funds of the Basel Convention (UNEP/CHW.1/24, Annex II, page 25-26), to provide every six months to the Extended Bureau through the Executive Secretary information on all sources of income received on the Trust Funds of the Basel Convention, including carry-over, plus actual provisional expenditures and commitments related to these Trust Funds;

13. Requests the Extended Bureau to keep under review the information provided under paragraphs 11 and 12 above;

14. Decides that the fifth meeting of the Conference of the Parties will be held in December 1999 in Basel, Switzerland, at the kind invitation of the Government of Switzerland, also to celebrate the tenth anniversary of the signature of the Basel Convention.

IV/23. DRAFT TECHNICAL GUIDELINES ON HAZARDOUS WASTE: PHYSICO-CHEMICAL TREATMENT (D9) AND BIOLOGICAL TREATMENT (D8)

The Conference

Having considered the draft text of the technical guidelines on physico-chemical treatment and biological treatment,

Takes note of these technical guidelines, which will be subject to additional comments and revision to be made by the Technical Working Group at its next session, and requests the Secretariat, once the draft guidelines have been finalized by the Technical Working Group, to publish and disseminate them to Parties, other States, intergovernmental organizations, business and industry, and environmental non-governmental organizations.

IV/24. PROPOSED WORK PROGRAMME OF THE TECHNICAL WORKING GROUP FOR 1998 AND 1999-2000

The Conference

1. Takes note of the proposed activities to be carried out by the Technical Working Group over the period 1998-2000, as shown in the attached tables, and of the priorities identified by the Conference, namely, items I, II.1, II.3 (first bullet), IV and V;

2. Extends the mandate of the Technical Working Group to enable it to carry out these proposed activities and invites Parties and other States as well as relevant sectors of industry and business to provide financial resources or assistance in kind to support the work of the Technical Working Group and of the Secretariat of the Basel Convention in the fulfilment of these tasks;

3. Requests the Technical Working Group, at its next session, to arrange its work programme taking into account the priorities identified by the Conference;

4. Further requests the Technical Working Group to report to meetings of the extended Bureau, as appropriate, and, through the extended Bureau, to the fifth meeting of the Conference of the Parties on progress made in the implementation of its work programme for 1998-2000.

Annex

TABLE OF PROPOSED ACTIVITIES OF THE TECHNICAL WORKING GROUP FOR 1998, 1999 AND 2000

TASKS	ACTIVITIES	YEAR (tentative)
I. Hazard characterization and classification of wastes	Carry forward responsibility for assessing wastes placed on list C, and for taking charge of review or adjustment procedure for lists of wastes (A and B), including initiation of work on waste about which particular concerns were expressed[20]	1998-2000
	Prepare a work programme for advancing with work on hazard characteristics, in particular concerning the hazard classes H6.2, H10, H11, H12 and H13	1998
	Implement work programme on hazard characteristics, including work on dioxins and dibenzofurans	1998-2000
	Elaborate guidance materials or technical guidelines to assist Parties and other States regarding the conclusion of bilateral, multilateral or regional agreements or arrangements	1998
	Consider the classification of waste pesticides destined for reformulation together with details of recovery operations of concern	1999
II. Technical Guidelines	Agree on final text for the technical guidelines on physico-chemical treatment (D9) and biological treatment (D8)	1998
	Prepare technical guidelines on: clinical waste (Y1) disposal of waste tyres waste batteries	1998
	Prepare technical guidelines on: recycling/reclamation of metals and metal compounds (R4) wastes resulting from surface treatment of metals and plastics (Y17)	1999-2000
III. Recovery, hazardous waste minimization and cleaner production	Continue with the work of selecting hazardous wastes susceptible to cleaner production approaches within the framework of the Basel Convention	
	Further initiate new case studies on recovery of hazardous wastes and assessment of recovery facilities	

[20] These wastes include wastes that are not easily identifiable in Annex I to the Basel Convention although the Technical Working Group expressed concerns as possibly presenting important hazard characteristics.

TASKS	ACTIVITIES	YEAR (tentative)
IV. Regional centres	Provide technical input or guidance to assist in the establishment and operation of regional centres for training and technology transfer regarding the management of hazardous wastes and the minimization of their generation	1998-2000
V. Harmonized Commodity Description and Coding System (HS)	Together with the World Customs Organization (WCO) and its Harmonize System Committee review the relationship between the lists of wastes (A and B) prepared by the Technical Working Group and the HS codes	1998
	Provide guidance to the Secretariat of the Basel Convention on eventuality of making new proposals to WCO after December 1997	1998
	Elaborate a work plan concerning cooperation with WCO, in particular in (i) providing technical guidance to WCO on hazardous wastes; (ii) recommending ways for Parties to use HS codes for wastes before formal entry into force of the amended HS; and (iii) any other matter of importance	1998
VI. Application of prior informed consent (PIC) for hazardous chemicals and persistent organic chemicals (POPs)	Provide technical guidance to the Secretariat of the Basel Convention on matters pertaining to coordination among inter-governmental bodies responsible or involved in developing legally binding instruments for hazardous chemicals to ensure there is no overlap with or gaps between these instruments and the Basel Convention	1998-2000
	Issue guidance notes or materials as necessary to the organizations involved in PIC and POPs on the classification and hazard characterization of wastes within the framework of the Basel Convention	
VII. Harmonization of lists of wastes and related procedures concerning their transboundary movements at the world level	Provide guidance to the Secretariat of the Basel Convention on the technical implications and modalities required to aim at achieving compatibility among the different international/ regional systems dealing with the control of transboundary movements of wastes and hazardous wastes	1998-2000
	Cooperate with OECD Pollution and Prevention Control Group and its Waste Management Policy Group on the matter of harmonization of the OECD and the Basel Convention control systems for wastes	
VIII. Annex II of the Basel Convention	Initiate work on the scope of Annex II (re: to facilitate classification of post-consumer materials such as plastics and other similar wastes)	1998-1999
IX. Other		

IV/25. TRIBUTE TO THE HOST COUNTRY AND DATES AND VENUE FOR THE NEXT MEETING OF THE CONFERENCE OF THE PARTIES

The Conference

1. Extends its thanks and gratitude to the Government of Malaysia and the State of Sarawak for the organization of the fourth meeting of the Conference of the Parties in Kuching and for the hospitality extended to all delegates;

2. Decides that the fifth meeting of the Conference of the Parties will take place in December 1999 in Basel, Switzerland;

3. Extends its gratitude to the Government of Switzerland for inviting the Contracting Parties to hold the fifth meeting of the Conference of the Parties in Basel, also to celebrate the tenth anniversary of the signature of the Basel Convention.

DECISIONS ADOPTED BY THE FIFTH MEETING OF THE CONFERENCE OF THE PARTIES

in Basel, Switzerland on 10 December 1999

V/1. BASEL DECLARATION ON ENVIRONMENTALLY SOUND MANAGEMENT

The Conference

Adopts the Basel Declaration on Environmentally Sound Management by acclamation.[21]

V/2. REPORT OF THE PARTIES AND SIGNATORIES ON THE IMPLEMENTATION OF DECISION II/12

The Conference

1. Takes note of the consolidated report prepared by the secretariat of the Basel Convention on the implementation of decision II/12;

2. Encourages the Parties, as well as non-Parties, to report on their implementation of decision II/12 in their report under article 13, in the light of the importance of that decision for the implementation of the Basel Convention;

3. Requests the secretariat to work on further consolidation of its report;

[21] Contained in annex II to the present report.

4. Further requests the Working Group for Implementation of the Basel Convention to submit a further consolidated report to the Conference of the Parties at its next meeting.

V/3. IMPLEMENTATION OF DECISION III/1 (AMENDMENT TO THE BASEL CONVENTION)

The Conference

1. Takes note of the progress made by Parties in effectively implementing decision III/1;

2. Welcomes the ratification or acceptance by several Parties of the amendment contained in decision III/1;

3. Strongly appeals to Parties to ratify the amendment contained in decision III/1 as soon as possible, to facilitate the early entry into force of the amendment.

V/4. REPORT ON THE IMPLEMENTATION OF DECISION IV/8 (DECISION REGARDING ANNEX VII)

The Conference

1. Welcomes the report prepared for the secretariat of the Basel Convention covering the first phase of the analysis of issues related to Annex VII;

2. Invites Parties, non-Parties and non-governmental organizations to provide any additional comments to the secretariat on the report that would improve its content;

3. Agrees to the elements of the evaluation for the second phase of the analysis, as adopted by the Technical Working Group and the Consultative Subgroup of Legal and Technical Experts at their joint meeting in April 1999;

4. Requests the secretariat to continue its work on the second phase of the analysis and to prepare a report on the implementation of the elements of the evaluation for consideration by the Technical Working Group and the Legal Working Group;

5. Further requests the Technical Working Group and the Legal Working Group to continue overseeing the development of the analysis and to provide guidance to the secretariat, as necessary, and to report to the Conference of the Parties at its sixth meeting on progress therewith.

V/5. REGIONAL CENTRES FOR TRAINING AND TECHNOLOGY TRANSFER

The Conference

1. Takes note of progress in the establishment and operation of regional and subregional centres, as well as of the present funding situation of activities related to those centres;

2. Welcomes the support, whether financial or in kind, provided by:

   (a) Government of Japan, for the regional centres in China and Indonesia;

   (b) Governments of China and Indonesia, for their support to the regional centres in those countries;

(c) Government of Switzerland, for the organization of national seminars in El Salvador and Nicaragua, through the subregional centre for Central America, and for the continued support for the subregional centre in Slovakia;

(d) Government of Argentina, for the subregional centre for South America, located in Argentina;

(e) Government of El Salvador, for the subregional centre for Central America and Mexico, located in El Salvador;

(f) Government of Trinidad and Tobago and the Caribbean Industrial Research Institute, for the subregional centre for the Caribbean;

(g) Government of Uruguay, for activities at the Coordinating Centre for Latin America and the Caribbean in Uruguay;

(h) Government of the Russian Federation, for the subregional centre in Moscow;

(i) Government of Slovakia, for its continued support to the subregional centre in Bratislava;

(j) Government of Nigeria, for the regional coordinating centre in Nigeria;

(k) Governments of Denmark and South Africa, for the subregional centre for English-speaking African countries in Pretoria (Vista University);

(l) Government of Egypt, for the subregional centre for Arabic-speaking countries in Cairo (Cairo University);

(m) Government of Senegal, for the subregional centre for French-speaking African countries in Senegal;

(n) Government of the United Kingdom of Great Britain and Northern Ireland, for training on asbestos management and abatement at the Caribbean Industrial Research Institute which is hosting the subregional centre for the Caribbean;

(o) Governments of Australia, Austria, Canada, Denmark, Germany, Japan, Mexico, Spain and the United States of America, for providing lecturers and resource persons to training courses and workshops;

(p) Government of the United States of America, for providing support to the subregional centres in Africa, the Caribbean and Central America;

(q) Other Governments contributing to the Technical Cooperation Trust Fund (non-earmarked funds), which made possible the conduct of training courses or workshops within the framework of the regional centres in Belarus, the Russian Federation, Sri Lanka and Uruguay;

(r) Regional Office for Western Asia of the United Nations Environment Programme, for the meeting organized in Bahrain concerning the establishment, in Egypt, of a subregional centre for Arabic-speaking countries in Africa and West Asia;

(s) Economic Commission for Latin America and the Caribbean and the Regional Office for Latin America and the Caribbean of the United Nations Environment Programme, for continuous support to the subregional centres in the Latin American and Caribbean region through the provision of resource persons for workshops and seminars and the

organization of the meeting by the Economic Commission for Latin America and the Caribbean in Bahia, Brazil, in 1997, on the implementation of the Basel Convention;

3. Further takes note of efforts made by other host countries to prepare for the establishment and initiation of activities at their respective centres;

4. Requests the secretariat of the Basel Convention to establish, pursue and reinforce its closer collaboration with relevant offices and programmes of the United Nations Environment Programme, for the implementation of joint activities on training and technology transfer related to hazardous wastes, in particular with the Division of Technology, Industry and Economics, Chemicals, the International Environment Technology Centre and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, and the regional seas programme;

5. Further requests the secretariat to collaborate closely with other relevant United Nations and other international agencies and conventions in the work of the regional and subregional centres, in particular with the United Nations Industrial Development Organization, the United Nations Institute for Training and Research, the World Health Organization, the Food and Agriculture Organization of the United Nations, the United Nations economic commissions, the International Maritime Organization, the Regional Organization for the Protection of the Marine Environment in Kuwait, the World Customs Organization and those regional treaties and instruments developed under the framework of the Basel Convention, with a view to exploring, on a continuous basis, new areas of cooperation;

6. Also requests the secretariat to keep an updated list of project fact-sheets available on the internet concerning proposals for which funding is being sought in relation to activities on training and technology transfer at the regional or subregional centres, as well as to other technical assistance activities;

7. Requests the secretariat to explore, in collaboration with the regional or subregional centres, possibilities for the establishment of partnerships with the industry sector, relevant non-governmental organizations and other stakeholders in the work of those centres, in order to ensure the long-term sustainability of their operation;

8. Recognizes the usefulness and efficiency of ensuring that, whenever feasible, regional, subregional and national seminars, training courses and workshops funded through the secretariat are being implemented within the framework of the regional centres network;

9. Requests the secretariat to continue to report to the Working Group for Implementation of the Basel Convention, on progress made in the establishment of regional or subregional centres, including proposals to be implemented in conjunction with the regional centres' programme;

10. Urges all Parties and non-Parties in a position to do so, as well as international organizations, including development banks, non-governmental organizations and the private sector, to make financial or in-kind contributions, either directly to the technical cooperation trust fund or on a bilateral level, to enable all centres to become fully operational, bearing in mind that comprehensive funding for the centres in their initial stage of operation, covering at least three to five years of support, including for core staffing, will facilitate the planning and implementation of their activities and encourage them to explore ways and means of ensuring the long-term sustainability of their respective centres;

11. Notes that the Technical Working Group will, as part of its proposed work programme, provide technical input or guidance to assist, as necessary, in the establishment and operation of regional or subregional centres;

12. Emphasizes the role of the regional or subregional centres with regard to implementation of the Basel Convention;

13. Emphasizes the role of the regional or subregional centres, with regard to training and capacity-building for the environmentally sound management, in particular, of wastes generated and existing in the region, and minimization of hazardous wastes, by taking into consideration a cleaner production approach, and their role in promoting awareness of the aims and provisions of the Basel Convention;

14. Recognizes the need for coordination and collaboration between all centres, including between different regions, inter alia, for the development of information systems, with a view to developing synergies;

15. Recalls the discussions at the fourth session of the Open-ended Ad Hoc Committee regarding the status of the centres and, in that context, recognizes the need for the enhancement of the status of the centres as a way to attract additional financial support and to identify diverse sources of funding, so as to secure the long-term sustainability of the centres, and that, in this connection, consideration should be given to its legal status as well as to financial mechanism and operational arrangements, including functions, a governing mechanism and staffing, and to commitments by countries participating in activities of the centre;

16. Recalls also the concerns expressed in the workshop on regional centres held immediately prior to the fifth meeting of the Conference of the Parties and, in that context, emphasizes the importance of equality between centres with regard to financial support and operational arrangements, in order to strengthen capacities at an equal level in all regions in implementing the Basel Convention, including the environmentally sound management of hazardous wastes and their minimization;

17. Requests the secretariat, taking into account various legal options for the centres and the need to address organizational and financial arrangements, further to develop in consultation with the representatives of the centres a draft framework agreement, including a core set of identical basic element for all centres, taking into account specific needs and priorities in the respective regions, for consideration by the Working Group for Implementation and for adoption by the Conference of the Parties at its sixth meeting.

V/6. CAPACITY-BUILDING ACTIVITIES WITHIN THE CONVENTION: TRAINING AND SEMINARS

The Conference

1. Requests the secretariat of the Basel Convention to continue developing training programmes, including curricula at the national level in cooperation with national authorities, and organizing national and regional training activities, as appropriate, within the framework of the regional and subregional centres for training and technology transfer, on the implementation of the Basel Convention, in collaboration with the United Nations Environment Programme and other international organizations, as well as the private sector and environmental non-governmental organizations;

2. Further requests the secretariat, in collaboration with the United Nations Environment Programme and other international organizations, as well as the private sector and environmental non-governmental organizations, actively to contribute to the implementation of the programme of activities of the regional centres by developing training materials, publications and other supporting materials, by facilitating the development of local and regional activities and case studies and by providing resource persons for training courses;

3. Also requests the secretariat to continue promoting public awareness on the aims of the Basel Convention through participation in related international conferences, symposia and seminars, through

the preparation and publication of brochures, newsletters, leaflets, press releases, case studies and other publications and material in this field, and through the consolidation of the web sites of the Basel Convention on the internet;

4. Urges Parties to contribute to the Trust Fund to Assist Developing and Other Countries in Need of Technical Assistance in the Implementation of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal established under the Basel Convention, with the aim of supporting the activities of developing countries and other countries in need of such assistance and the secretariat in developing training and capacity-building activities, as well as awareness-raising activities;

5. Invites all Parties that are in a position to do so to contribute to the trust funds to cover the costs of participation of developing country representatives at meetings and seminars organized by the secretariat, or to make in-kind contributions through, inter alia, the provision of resource persons for the organization of seminars, workshops and training programmes.

V/7. CAPACITY-BUILDING ACTIVITIES WITHIN THE CONVENTION: CURRENT AND PLANNED LEGAL, TECHNICAL AND INSTITUTIONAL ASSISTANCE

The Conference

1. Notes the declaration made by the mayors of several cities in West Africa at the regional consultation on the environmentally sound management of biomedical wastes held in Dakar, from 9 to 11 November 1998;

2. Notes the declaration of the group of African countries made at the fourteenth session of the Technical Working Group held in Pretoria, from 2 to 5 November 1998;

3. Reiterates the importance for Parties to provide financial resources to the Technical Cooperation Trust Fund to assist developing countries and countries with economies in transition that are Parties to the Convention in implementing the Basel Convention and in managing hazardous wastes in an environmentally sound manner;

4. Invites Parties, non-Parties, intergovernmental organizations, members of the industry and business sectors, and non-governmental organizations to provide financial resources or assistance in kind, to assist countries in need of such assistance in the development of training activities and technology transfer for the environmentally sound management and control of hazardous wastes;

5. Promotes the development of a programme of workshops, to be held on the occasion of the meetings of Basel Convention subsidiary bodies, through a process of exchanging and reviewing information received from focal points and competent authorities from the different Parties, relating to their experience in capacity-building issues, and by addressing aspects relating to the implementation of the Convention that need clarification;

6. Also invites Parties, other States and potential donors to contribute financially, technically or in kind to the implementation of specific project activities, the conduct of which has been requested by the Parties.

V/8. COOPERATION WITH THE UNITED NATIONS ENVIRONMENT PROGRAMME ON THE ACTIVITIES UNDERTAKEN AT THE GLOBAL LEVEL ON PERSISTENT ORGANIC POLLUTANTS

The Conference

1. Notes the substantive progress made by the secretariat of the Basel Convention in strengthening cooperation with the Chemicals Division of the United Nations Environment Programme on matters pertaining to persistent organic pollutants;

2. Further notes the tasks contained in the work programme of the Technical Working Group of relevance to persistent organic pollutants;[22]

3. Requests the secretariat, under the guidance of the Technical Working Group, to continue its cooperation with the Chemicals Division of the United Nations Environment Programme and the Food and Agriculture Organization of the United Nations, and also with other relevant intergovernmental organizations, on the issue of persistent organic pollutants, in particular, with a view, first, to building the capacities of developing countries and other countries in need of such assistance to manage waste persistent organic pollutants in an environmentally sound manner; second, to ensuring efficient use of resources and identifying areas of common interest and opportunities for synergy; third, to providing technical and other guidance to the Intergovernmental Negotiating Committee on persistent organic pollutants, as appropriate; and, fourth, to identifying overlaps and gaps and the means to overcome them;

4. Also requests the secretariat to report to the Conference of the Parties at its next meeting, as well as to the Technical Working Group, on its cooperation with the Chemicals Division of the United Nations Environment Programme and the Food and Agriculture Organization of the United Nations, and also with other intergovernmental organizations, on issues related to persistent organic pollutants.

V/9. COOPERATION BETWEEN THE BASEL CONVENTION AND THE ROTTERDAM CONVENTION ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE

The Conference

1. Notes with appreciation the documentation provided on the Rotterdam Convention;

2. Requests the secretariat of the Basel Convention to continue its cooperation with the secretariat of the Rotterdam Convention and to report thereon to the Conference of the Parties at its next meeting, as well as to the Technical Working Group.

V/10. COOPERATION WITH THE WORLD CUSTOMS ORGANIZATION

The Conference

1. Welcomes the work initiated by the Harmonized System Committee on the possibility of establishing a correlation between the Harmonized System and the Basel Convention;

2. Requests the Technical Working Group, as part of its work programme, to provide guidance to the Harmonized System Committee, as appropriate, on the separate identification of hazardous wastes and other wastes in the Harmonized System, including the formulation of proposals to be submitted to the World Customs Organization for the possible inclusion of new hazardous wastes and other wastes in the Harmonized System;

[22] See table annexed to decision V/26.

3. Further requests the Technical Working Group to keep the matter of correlation between the Harmonized System and the Basel Convention lists of wastes under review and to provide, as necessary, guidance to the Harmonized System Committee as it progresses in its work;

4. Requests the secretariat, under the guidance of the Technical Working Group, to pursue its cooperation with the World Customs Organization on matters pertaining to the separate identification of hazardous wastes and other wastes in the Harmonized System and on correlation between the Harmonized System and the Basel Convention;

5. Also requests the secretariat to continue its close cooperation with the World Customs Organization on matters pertaining, first, to joint training activities relating to implementation of the Basel Convention and of the Harmonized System; and, second, to the continuation of its cooperation on the control of transboundary movements of hazardous wastes and other wastes and the prevention of illegal traffic in such wastes.

V/11. COOPERATION WITH THE ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

The Conference

1. Notes the progress made by the Working Group on Waste Management Policy of the Organisation for Economic Cooperation and Development on the harmonization of the Control System of the Organisation for Economic Cooperation and Development with the Basel Convention;

2. Requests the secretariat of the Basel Convention to continue its cooperation with the Environment Directorate of the Organisation for Economic Cooperation and Development on matters pertaining to work on harmonization and information exchange;

3. Requests the Technical Working Group to provide guidance to the secretariat, as necessary, in regard to the secretariat's cooperation with the Organisation for Economic Cooperation and Development on the matter of harmonization of the Organisation's Control System with the Basel Convention.

V/12. COOPERATION WITH UNITED NATIONS BODIES, SPECIALIZED AGENCIES, REGIONAL SYSTEMS AND ORGANIZATIONS AND OTHERS

The Conference

1. Takes note of activities undertaken by the secretariat of the Basel Convention to cooperate with key organizations of the United Nations system, regional conventions and commissions, other conventions and intergovernmental bodies;

2. Requests the secretariat of the Basel Convention, with a view to avoiding duplication and promoting synergies, further to strengthen its cooperation on critical areas for the implementation of the Basel Convention with relevant United Nations bodies and specialized agencies, including with relevant offices of the United Nations Environment Programme, the International Maritime Organization, the International Atomic Energy Agency, the United Nations Industrial Development Organization and other international organizations and regional conventions and commissions, and to submit a comprehensive report thereon to the Conference of the Parties at its sixth meeting.

V/13. COOPERATION WITH ENVIRONMENTAL NON-GOVERNMENTAL ORGANIZATIONS AND WITH THE INDUSTRY AND BUSINESS SECTORS

The Conference

1. Notes the enhanced working relationship with several members of the industry sector and environmental non-governmental organizations in the implementation of the Basel Convention;

2. Requests the secretariat of the Basel Convention to pursue its cooperation with relevant areas of the industry sector and with environmental and other non-governmental organizations, in particular, with a view to promoting the environmentally sound management of hazardous wastes and the minimization of their generation, through, inter alia, the provision of other relevant information to assist in the implementation of and compliance with the Basel Convention;

3. Requests the secretariat, in close collaboration with the regional centres for training and technology transfer, to explore ways and means of establishing partnerships with the industry sector and with non-governmental organizations, with a view to promoting and improving the management and minimization of such wastes, as well as to promoting awareness on hazardous waste issues, as appropriate, and to report to the Working Group for Implementation at its next session on progress in this area.

V/14. IMPLEMENTATION OF DECISION IV/3 (TRANSMISSION OF INFORMATION)

The Conference

1. Takes note of the compilation of documents prepared by the secretariat, based on the information reported by Parties in accordance with articles 13 and 16 of the Basel Convention, for the years 1996 and 1997;

2. Takes note of the country fact-sheets prepared by the secretariat for the year 1997;

3. Welcomes the graphic presentation of the 1997 data reported by the Parties to the secretariat, contained in the publication Basel Convention Series/SBC No. 99/011, Part II;

4. Acknowledges the efforts made by the Parties to provide information to the Secretariat for the calendar years 1996 and 1997;

5. Also acknowledges the difficulties that some Parties might have, particularly developing countries, in gathering data and information in accordance with the reporting requirements of article 13, due to the lack of proper arrangements and procedures in place at the national level for this purpose;

6. Requests the Parties that are in a position to do so to collaborate with and assist developing country Parties in setting up procedures and other arrangements to facilitate the collection of data and preparation of inventories of hazardous wastes;

7. Urges the Parties that have not yet done so to report on articles 13 and 16 for the calendar years 1997 and 1998 as soon as possible, using the questionnaire provided for this purpose by the Secretariat and bearing in mind that, in accordance with the provisions of article 13, Parties are requested to transmit, before the end of each calendar year, a report on information for the previous calendar year;

8. Recalls that such information has to be provided by Parties to the secretariat for the calendar year 1999 before the end of the calendar year 2000;

9. Requests the secretariat to review the existing questionnaire used for reporting under Articles 13 and 16, with a view to simplifying it as appropriate, so as to facilitate reporting by Parties from the year 1999 onwards;

10. Requests the secretariat to prepare the compilations and country fact- sheets for the years 1998 and 1999 and to make such information available on a regular basis to the Parties and non-Parties;

11. Requests the secretariat to continue its efforts in ensuring the availability of graphic presentations of the data provided by Parties for the years 1998 and 1999;

12. Requests the secretariat to continue its efforts in harmonizing data collection with other international bodies;

13. Requests the secretariat to explore the possibilities of developing indicators on hazardous wastes to facilitate decision-making and to report thereon to the Conference of the Parties at its sixth meeting.

V/15. INFORMATION MANAGEMENT AND DISSEMINATION - DEVELOPMENT OF THE INFORMATION SYSTEM ON HAZARDOUS WASTES AND THEIR MANAGEMENT

The Conference

1. Takes note of the further development of the information system on hazardous wastes and their management under the Basel Convention;

2. Further takes note of the development of the three-level questionnaire, which is intended to facilitate compliance by the Parties with the reporting requirements under articles 13 and 16;

3. Welcomes the financial support from the Government of Japan, which made it possible to initiate the development of the information system on hazardous wastes and their management under the Basel Convention;

4. Requests the secretariat to promote access to the Basel Convention information system on the internet, including information received in relation to articles 13 and 16, as well as the documentation and reports of Basel Convention meetings, Basel Convention newsletters and other promotional material;

5. Also requests the secretariat, in the further development of the information system, to explore the possibility of making the questionnaires for articles 13 and 16 available on the internet in such a way as to make possible the direct entering through the internet of the data by the respective Parties, which would considerably facilitate the work by the secretariat of processing those data;

6. Further requests the secretariat to work closely with other parts of the United Nations and other relevant organizations, in particular the United Nations Environment Programme, which are developing databases or operating databases or information systems of direct relevance to the Basel Convention, including with the European Topic Centre on Wastes affiliated to the European Environment Agency.

V/16. MONITORING THE IMPLEMENTATION OF AND COMPLIANCE WITH THE OBLIGATIONS SET OUT BY THE BASEL CONVENTION

The Conference

Requests the Legal Working Group to prepare a draft decision for adoption by the Conference of the Parties at its sixth meeting, establishing a mechanism for promoting implementation and compliance based on the draft elements annexed to the present decision.

Annex

MONITORING THE IMPLEMENTATION OF AND COMPLIANCE WITH THE OBLIGATIONS SET OUT BY THE BASEL CONVENTION

1. The mechanism, to be administered by an existing or a new body, should monitor implementation of and compliance with the Basel Convention with a view to recommending the best way to promote full implementation of the provisions of the Convention. The mechanism should be transparent, cost-effective, preventive in nature, simple, flexible, non-binding and oriented in the direction of helping Parties to implement the provisions of the Basel Convention. It will pay particular attention to the needs of developing countries.

A. Composition and tenure

2. An existing body or a new body can administer the mechanism. If a new body is to be established:

(a) The number of its members should be limited and small (between 14 and 20);

(b) It may be composed of independent experts and/or State representatives, taking into account an equitable geographical distribution (e.g., ensuing representation from both developing and developed countries, from both hazardous waste exporting/producing and importing countries, and from different geographical regions);

(c) Members could be elected by the Conference of the Parties;

(d) The body should meet as often as necessary;

(e) The term of the body could range between one and three years or from one meeting of the Conference of the Parties to the next meeting of the Conference of the Parties, and possibly be renewable.

B. Functions

1. The body could have the following functions:

(a) To provide Parties with advice, recommendations and information relating to:

(i) Establishing and strengthening of domestic regulatory regimes;

(ii) Enforcing and implementing laws, including border controls;

(iii) Ensuring the environmentally sound management and disposal of hazardous wastes;

(iv) Training customs and other personnel;

(v) Procuring technical and financial assistance from external sources;

(vi) Establishing and developing means of detecting and eradicating illegal traffic, including investigating, sampling and testing;

(b) To consult with Parties on ways to facilitate their implementation of and compliance with the obligations set out by the Basel Convention;

(c) To monitor, assess and facilitate reporting under article 13 of the Basel Convention;

(d) To monitor and assist individual Parties in their efforts to implement decisions of the Conference of the Parties on compliance;

(e) To consult other bodies as required;

(f) To make recommendations on monitoring and compliance issues, including priorities;

(g) To report to the Conference of the Parties and its subsidiary bodies.

4. In addition to performing the functions listed under subparagraphs 3 (a)-(g) above, the body may provide assistance in individual cases when specific implementation and compliance questions are raised. In these cases, the assistance of the body may be invoked:

(a) By a Party (or Parties) with respect to its (their) own activities or activities of other Parties in which it is (they are) directly involved;

(b) By the Conference of the Parties, and its subsidiary bodies where so mandated by the Conference of the Parties.

V/17. ANALYSIS OF THE DISPUTE SETTLEMENT MECHANISM UNDER ARTICLE 20 OF THE BASEL CONVENTION

The Conference

Recalling its decision IV/21,

1. Welcomes the steps already taken by the secretariat of the Basel Convention in the collection of information concerning aspects of dispute settlement under the Basel Convention;

2. Invites Parties which have not yet replied to the set of questions to do so, to facilitate progress on this matter;

3. Requests the Legal Working Group to give further consideration, inter alia, to the issue of the analysis of the dispute settlement under article 20 of the Basel Convention and to advise on future work on that issue.

V/18. EMERGENCY FUND

The Conference

Having addressed the issue of and need for a financial mechanism for emergency situations, as envisaged in paragraph 2 of article 14 of the Basel Convention,

Taking note of Article 15 of the Protocol on Liability and Compensation for Damage Resulting from Transboundary Movement of Hazardous Wastes and their Disposal,

Taking also into consideration the Caribbean proposal on the emergency fund annexed to the secretariat's note on the issue prepared for the fifth meeting of the Conference of the Parties,[23]

Requests the Legal Working Group to consider and finalize the financial mechanism for emergency situations, with a view to presenting its recommendation to the Conference of the Parties at its sixth meeting.

Invites Parties which have not yet informed the secretariat of the Basel Convention of the designation of their competent authorities and focal points to do so as soon as possible to facilitate the implementation of the Basel Convention.

V/19. COMPETENT AUTHORITIES AND FOCAL POINTS

The Conference

Invites Parties which have not yet informed the secretariat of Basel Convention of the designation of their competent authorities and focal points to do so as soon as possible to facilitate the implementation of the Basel Convention.

V/20. BILATERAL, MULTILATERAL OR REGIONAL AGREEMENTS OR ARRANGEMENTS

The Conference

1. Takes note of the bilateral, multilateral or regional agreements or arrangements concluded before and after the entry into force of the Convention, as reported under article 11 of the Basel Convention;

2. Requests the Parties that have entered, in accordance with article 11, into bilateral, multilateral or regional agreements or arrangements and that have not yet reported on the conformity of such agreements or arrangements with the said article, to report through the secretariat of the Basel Convention to the Working Group for Implementation at its next session, taking into account the list of questions annexed to decision II/10;

3. Requests the secretariat continuously to update the list of bilateral, multilateral or regional agreements or arrangements in effect, as reported to the secretariat, and to distribute this list on a regular basis to the Parties and non-Parties.

V/21. DRAFT GUIDANCE ELEMENTS FOR BILATERAL, MULTILATERAL OR REGIONAL AGREEMENTS OR ARRANGEMENTS

The Conference

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[23] UNEP/CHW.5/14.

1. Extends the mandate of the Technical Working Group and requests this Group and the Legal Working Group to finalize the draft guidance elements for bilateral, multilateral or regional agreements and present the draft guidance elements for approval, through the Working Group for Implementation, by the Conference of the Parties at its sixth meeting;

2. Requests the Parties to present to the secretariat of the Basel Convention their views and proposals for the finalization of the draft guidance elements for bilateral, multilateral or regional agreements or arrangements.

V/22. WORK PROGRAMME OF THE LEGAL WORKING GROUP

The Conference

1. Adopts the programme of work of the Legal Working Group as shown in the annex to the present decision;

2. Requests the Legal Working Group, at its next session, to decide which of the proposed activities have to be carried out as a matter of priority, taking into account the priorities identified by the Conference of the Parties and the arrangements that would be necessary for that purpose.

Annex

WORK PROGRAMME OF THE LEGAL WORKING GROUP

Tasks	Activities	Year (Tentative)
I. Monitoring implementation of and compliance with the obligations set out by the Basel Convention	Finalize the proposal for establishing a mechanism on implementation and compliance.	
II. Dispute settlement mechanism	Further examine the dispute settlement mechanism that exists under article 20 of the Basel Convention and consider whether it continues to meet the needs of the Parties to the Convention.	
III. Emergency fund or mechanism	Further consider the establishment of a revolving fund or mechanism to assist on an interim basis in cases of emergency situations to minimize damage from accidents arising from the transboundary movements of hazardous wastes and other wastes or during the disposal of those wastes. Further consider the elements that would be required for establishing such an emergency fund or mechanism, the relationship between such an emergency fund or mechanism and the protocol on liability and compensation, and the availability of institutions able to provide prompt and adequate assistance in emergency situations.	
IV. Prevention and monitoring of illegal traffic	Develop procedures to address alleged cases of illegal traffic in hazardous wastes. In cooperation with the Technical Working Group, finalize the draft guidance elements for the detection, prevention and control of illegal traffic in hazardous wastes.	
V. Bilateral, regional and multilateral agreements or arrangements	In cooperation with the Technical Working Group, finalize the text of the draft guidance elements for bilateral, multilateral and regional agreements or arrangements.	
VI. Decision IV/8 regarding Annex VII	In cooperation with the Technical Working Group, further explore issues relating to Annex VII and provide Parties with a detailed and documented analysis that would highlight issues related to Annex VII.	

Tasks	Activities	Year (Tentative)
VII. Dismantling of ships	In cooperation with the Technical Working Group, analyse the legal matters under the Basel Convention relating to the issue of the full and partial dismantling of ships, with a view to reporting to the Conference of the Parties, at its sixth meeting, on how this issue should finally be resolved.	
VIII. Other tasks	Provide legal advice to the regional centres for training and technology transfer, to ensure that they follow a coherent approach in their activities, and advise on any other matter as required by the Conference of the Parties.	

V/23. PREVENTION AND MONITORING OF ILLEGAL TRAFFIC IN HAZARDOUS WASTES AND OTHER WASTES

The Conference

1. Extends the mandate of the Technical Working Group and requests the Legal Working Group to give further consideration to the issue of illegal traffic in hazardous wastes and other wastes, to develop recommended procedures to address alleged cases of illegal traffic and to assist Parties in preventing, identifying, monitoring and managing illegal traffic, taking into account the draft guidance elements for the detection, prevention and control of illegal traffic in hazardous wastes, approved by the Technical Working Group and the Consultative Subgroup of Legal and Technical Experts at their first joint meeting, in Pretoria, in November 1998;

2. Appeals to Parties to bring any confirmed case or, after consultation and agreement with the other Parties involved, alleged case of illegal traffic to the attention of the secretariat of the Basel Convention, with all the necessary information to enable the secretariat to take appropriate action, including support for any efforts by the Parties to solve the issues, such as the provision of appropriate expertise;

3. Invites Parties to use the approved form in their reports to the secretariat related to confirmed cases of illegal traffic;

4. Requests the secretariat to continue its cooperation with various regional commissions and secretariats of regional conventions and protocols, non-governmental organization, the industry sector and the private sector, as well as the World Customs Organization and the International Criminal Police Organization, in order to achieve a better control and monitoring of cases or alleged cases of illegal traffic in hazardous wastes and other wastes;

5. Requests the Parties and the secretariat to take the necessary preventive measures, in particular through the dissemination of information on the Basel Convention and through working closely with the World Customs Organization, to include, as a matter of priority, the wastes under the scope of the Convention in the Harmonized System;

6. Requests the secretariat, bearing in mind the provisions of decision IV/12, to work closely with the United Nations Committee of Experts on the Transport of Dangerous Goods to harmonize classification and labelling systems for hazardous wastes and dangerous goods;

7. Requests the Parties, with the assistance of the secretariat, to organize training courses and develop training manuals, at the national and regional levels, for customs officers and police forces, in

cooperation with the World Customs Organization, the International Criminal Police Organization and other appropriate bodies, including United Nations regional commissions and secretariats of regional agreements dealing with similar issues.

V/24. CLASSIFICATION AND HAZARD CHARACTERIZATION OF WASTES

The Conference

1. Notes with appreciation the progress made by the Technical Working Group on the classification and hazard characterization of wastes and the decision to adjust entry B2060 (Spent activated carbon) of Annex IX;

2. Adopts the procedure for reviewing or adjusting the list of wastes,[24] as approved by the Technical Working Group, and acknowledges the need for further elaboration of the procedure for submitting decisions of the Technical Working Group to the Conference of the Parties, with a view to proposing an amendment of the Annex VIII or Annex IX, and requests the Technical Working Group to adjust the procedure as appropriate;

3. Further notes the agreement of the Technical Working Group on the course of action with regard to the review of wastes placed on list C and requests the Technical Working Group to keep these wastes under review and to report to the Conference of the Parties, at its next meeting, on its conclusions and recommendations;

4. Commends the lead Parties and signatory, namely, Denmark, Egypt, the European Community, the United Kingdom of Great Britain and Northern Ireland and the United States of America, for their work in the preparation of draft scoping papers for the hazard characteristics H6.2, H11, H12 and H13 and requests the Technical Working Group to finalize its work on those hazard characteristics for consideration by the Conference of the Parties at its next meeting;

5. Also requests the Technical Working Group to initiate work on the hazard characteristic H10, as appropriate, and to report on progress to the Conference of the Parties at its next meeting.

V/25. DRAFT TECHNICAL GUIDELINES FOR THE IDENTIFICATION AND ENVIRONMENTALLY SOUND MANAGEMENT OF PLASTIC WASTE AND FOR ITS DISPOSAL

The Conference

1. Takes note of the draft technical guidelines for the identification and environmentally sound management of plastic waste and for its disposal developed so far;

2. Takes note of the comments received from experts on the draft technical guidelines;

3. Requests the secretariat of the Basel Convention to prepare a revised version of the technical guidelines for consideration by the Technical Working Group at its next meeting, taking into consideration the proposed structure of the technical guidelines[25], as well as the additional comments and information provided by the experts;

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[24] See annex IV to the present report.

[25] See attached Annex III to the report on the work of the Technical Working Group - UNEP/CHW.5/19.

4. Requests the Technical Working Group to finalize its work on the technical guidelines for consideration by the Conference of the Parties at its sixth meeting;

5. Invites the Technical Working Group to make available the final version of the technical guidelines in advance of the sixth meeting of the Conference of the Parties once the Group has adopted the technical guidelines.

V/26. WORK PROGRAMME OF THE TECHNICAL WORKING GROUP

The Conference

1. Commends Parties, in particular Australia, Germany, India and the Netherlands, for taking the lead in the preparation of technical guidelines and encourages other Parties to assist in that work;

2. Adopts the programme of work of the Technical Working Group, as contained in the annex to the present decision;

3. Takes note of the considerable progress made with regard to the preparation of technical guidelines on the environmentally sound management of biomedical and health-care wastes and further encourages Parties to finalize the guidelines for consideration and adoption by the Conference of the Parties at its sixth meeting;

4. Extends the mandate of the Technical Working Group to carry out the tasks contained in its work programme and invites Parties to continue providing technical and financial assistance to enable the Technical Working Group to fulfil its tasks;

5. Requests the Technical Working Group, at its next session, to arrange its work programme taking into account the priorities identified by the Parties;

6. Further adopts:

(a) The Technical Guidelines on Physico-Chemical Treatment (D9) and Biological Treatment (D8);

(b) The Technical Guidelines on the Identification and Management of Used Tyres;

7. Requests the secretariat to keep Parties and others informed, on a regular basis, of the work accomplished by the Technical Working Group.

Annex

WORK PROGRAMME OF THE TECHNICAL WORKING GROUP

Tasks	Activities
I. Classification and hazard characterization of waste	Classification Review of applications Review of status of wastes on list C Review or adjustment of lists of wastes contained in Annexes VIII and IX Preparation of elements of an information paper on the purpose of Annex IX Hazard characterization Finalization of work on the hazard characteristics H6.2; H11; H12 and H13 Initiation of work on the hazard characteristic H10 Review of available and forthcoming scientific information concerning the evaluation of the potential environmental health effects of the disposal of PVC wastes and PVC-coated cables. Initiation of work on: Implementation of a work programme on dioxins and dibenzofurans Classification of waste pesticides destined for reformulation, together with details of recovery operations of concern

Tasks	Activities
nical guidelines	Finalization of the technical guidelines on environmentally sound management of biomedical and health-care waste. Finalization of the technical guidelines for the identification and environmentally sound management of plastic waste and for its disposal. Preparation of the following technical guidelines on: Waste batteries; Monitoring and closure plans for the facilities (guidance to operators); Recycling/reclamation of metals and metal compounds (R4); Wastes resulting from surface treatment of metals and plastics (Y17). Consideration of the further preparation of technical guidelines on the environmentally sound management of persistent organic pollutants.
III. Harmonized Commodity Description and Coding System (HS) of the World Customs Organization (WCO)	Initiate work, through the secretariat, with WCO on the issue of correlation of the lists of wastes of the Basel Convention with the HS codes. The secretariat to liaise with UNCETDG, IMO and OECD on this matter. Propose a framework and action for ensuring proper reflection of the wastes covered by the Basel Convention in the HS.
IV. Annex II of the Basel Convention	Initiate work on the scope of Annex II.
V. Decision IV/8 regarding Annex VII	In cooperation with the Legal Working Group, further explore issues relating to Annex VII and provide Parties with a detailed and documented analysis that would highlight issues related to Annex VII.

Tasks	Activities
VI. Cooperation with UNEP Chemicals and relevant organizations	Prior informed consent (PIC) for hazardous chemicals (Rotterdam Convention) and persistent organic pollutants (POPs): Issue guidance notes or materials as necessary to the organizations responsible for the Rotterdam Convention and POPs on the classification and hazard characterization of wastes within the framework of the Basel Convention; Provide technical guidance to the secretariat of the Basel Convention on matters pertaining to coordination among intergovernmental bodies responsible or involved in developing a legally binding instrument for POPs, to ensure that there is no overlap with or gaps between this instrument and the Basel Convention; Consider the issue of the stockpiling for the purpose of disposal/destruction, or for recycling.
VII. Work on harmonization	Harmonization of lists of wastes and related procedures concerning transboundary movements of wastes and hazardous wastes at the world level. Provide guidance to the secretariat of the Basel Convention on technical implications and modalities required to aim at achieving compatibility among the different international and regional systems dealing with the control of transboundary movements of wastes and hazardous wastes. The secretariat of the Basel Convention to cooperate closely with OECD on this matter. Keep under review work under way at intergovernmental forums (e.g., UNCETDG, ILO, OECD) on the global harmonization of systems of classification and labelling of chemicals.
VIII. Dismantling of ships	Preparation of guidelines for the environmentally sound management of full or partial dismantling of ships in close collaboration with IMO.
er tasks	Regional centres for training and technology transfer: provision of technical input or guidance to assist in the establishment and operation of the regional centres. Recovery, hazardous wastes minimization and cleaner production: Continue with the work of selecting hazardous waste susceptible to cleaner production approaches within the framework of the Basel Convention; Further initiate case studies on recovery of hazardous waste and assessment of recovery facilities.

V/27. HAZARDOUS WASTE MINIMIZATION

The Conference

1. Welcomes the activities undertaken by the Regional Centre for Training and Technology Transfer in Bratislava on cleaner production and waste minimization and encourages other regional centres established under the Basel Convention to address this issue as one of their priorities;

2. Welcomes the work initiated between the Division of Technology, Industry and Economics of the United Nations Environment Programme and the secretariat of the Basel Convention for the promotion of collaboration on their respective programmes on the United Nations Environment Programme/United Nations Industrial Development Organization national cleaner production centres and the regional centres under the Basel Convention;

3. Invites Parties to cooperate in the minimization of the generation of hazardous wastes, in particular through the use of cleaner production methods and environmental management systems;

4. Further invites Parties that are currently using cleaner production methods or technologies in their industrial processes and product design to facilitate and cooperate in the transfer of those methods and technologies to other Parties;

5. Encourages Parties, in accordance with their national legislation and practices, and requests the secretariat to work closely with the industry sector and appropriate non-governmental organizations for the minimization of hazardous wastes;

6. Notes that the Technical Working Group, as part of its proposed work programme, will provide guidance, as necessary, to the regional centres for training and technology transfer relating to activities to be undertaken for the selection of waste streams susceptible for cleaner production;

7. Urges the secretariat and the Division of Technology, Industry and Economics to initiate joint activities as soon as possible between the national cleaner production centres and the regional centres for training and technology transfer under the Basel Convention, preferably through a formal agreement, which would outline the modalities for such collaboration and specify the type of joint activities to be undertaken;

8. Requests the secretariat to report on progress in the work on waste minimization to the Working Group for Implementation at its next session.

V/28. DISMANTLING OF SHIPS

The Conference

1. Notes the agreement of the Technical Working Group and the Consultative Subgroup of Legal and Technical Experts of the Basel Convention, at their joint meeting, on the course of action with regard to the dismantling of ships;

Gives a mandate to:

(a) The Technical Working Group, to collaborate, through the secretariat of the Basel Convention, with the appropriate body of the International Maritime Organization on the subject of the

full and partial dismantling of ships and to prepare guidelines for the environmentally sound management of the dismantling of ships;

(b) The Technical Working Group and the Legal Working Group, to discuss the legal aspects under the Basel Convention relating to the issue of the full and partial dismantling of ships;

3. Requests these two bodies to report to the Conference of the Parties at its sixth meeting, through the Working Group for Implementation, on how this issue should finally be resolved.

V/29. BASEL PROTOCOL ON LIABILITY AND COMPENSATION FOR DAMAGE RESULTING FROM THE TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

The Conference

Adopts the Basel Protocol on Liability and Compensation for Damage resulting from the Transboundary Movements of Hazardous Wastes and their Disposal.[26]

V/30. ARTICLE 3 OF THE CONVENTION

The Conference

Having regard to the need to facilitate the implementation of Article 3 of the Convention,

Requests the secretariat to keep available on a website an updated list of the wastes which are defined or considered as hazardous by a Party pursuant to Article 1, paragraph (1) (b), and have been notified to the secretariat in accordance with Article 3 of the Convention, as well as to provide the Parties with paper copies of that list.

V/31. RELATIONSHIP OF THE PROTOCOL WITH THE BASEL CONVENTION

The Conference

Taking note of article 23 of the Protocol on Liability and Compensation for Damage resulting from the Transboundary Movements of Hazardous Wastes and their Disposal,

Desiring further to consider whether and how these powers should be exercised at the next Conference of the Parties,

1. Requests the Legal and Technical Working Groups at their joint meetings to consider paragraph (2) of annex B with a view to the presentation of its recommendation to the Conference of the Parties at its sixth meeting;

2. Requests the secretariat to undertaken appropriate preparatory work, in consultation with the Parties, to facilitate the deliberations of the Legal and Technical Working Groups on the basis of the studies that have been completed and consulting experts in the field as necessary.

V/32. ENLARGEMENT OF THE SCOPE OF THE TECHNICAL COOPERATION TRUST FUND

The Conference

Recalling its decisions I/14, II/2, III/3 and IV/20 concerning the emergency fund,

Recalling its decisions I/5, II/1, III/2 and IV/19 concerning the adoption of a protocol on liability and compensation,

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[26] See annex III to the present report.

Recalling its decisions I/7 and IV/22 concerning the Technical Cooperation Trust Fund of the Basel Convention,

Referring to its decision V/29 on the adoption of the Protocol on Liability and Compensation,

1. Decides on an interim basis to enlarge the scope of the Technical Cooperation Trust Fund of the Basel Convention to assist the Contracting Parties which are developing countries or countries with economies in transition in cases of emergency and compensation for damage resulting from incidents arising from transboundary movements of hazardous wastes and other wastes and their disposal;

2. Decides that the Secretariat of the Basel Convention may, upon request, use the funds referred to in paragraph 8 to assist a Party to the Convention which is a developing country or a country with economy in transition in case of an incident occurring during a transboundary movement of hazardous wastes and other wastes covered by the Basel Convention in order:

(a) To estimate the magnitude of damage occurred or damage that may occur and the measures needed to prevent damage;

(b) To take appropriate emergency measures to prevent or mitigate the damage;

(c) To help find those Parties and other entities in a position to give the assistance needed;

3. Also decides that, where damage occurs that is covered by the Liability and Compensation Protocol, the Secretariat of the Basel Convention may, upon request by a Contracting Party which is a developing country or a Contracting Party which is a country with economy in transition, use the funds referred to in paragraph 8 to provide compensation for damage to and reinstatement of the environment up to the limits provided for in the Protocol, where such compensation and reinstatement is not adequate under the Protocol, and that the present paragraph will become operational on the date the Protocol enters into force;

4. Also decides that the Secretariat of the Basel Convention may, upon request, use the funds referred to in paragraph 8 to assist a Party to the Convention which is a developing country or a country with economy in transition in developing its capacity-building and transfer of technology and in putting in place measures to prevent accidents and damage to the environment caused by the transboundary movement of hazardous wastes and other wastes and their disposal;

5. Further decides that the Parties shall evaluate the information made available by the Secretariat on:

(a) Functioning of this interim arrangement;

(b) The number of incidents arising from transboundary movements of hazardous wastes and other wastes and their disposal;

(c) With regard to each incident, the nature of the damage, the costs of preventive measures and measures of reinstatement;

(d) With regard to each incident, the extent to which damage was not compensated;

6. Requests the Secretariat to provide to the Parties the information referred to in the previous paragraph as it becomes available and in any case not later than one year after the adoption of the present decision;

7. Notes that the evaluation referred to in paragraph 5 shall be done in order to enable the Conference of the Parties at its sixth meeting to decide on the need to maintain, improve, change this interim arrangement or propose additional measures:

(a) To provide for the costs of preventive measures and measures of reinstatement for damage from accidents arising from transboundary movements of hazardous wastes and other waste under the Convention or during the disposal of the wastes;

(b) To provide for compensation when the person liable is or remains unknown, disappears or cannot be found, or is or may become financially incapable of meeting his or her obligation, or the liable person is exempted from liability in conformity with Article 4, paragraph 5 of the Protocol, and with regard to illegal traffic;

8. Urges Parties to provide contributions to the Technical Cooperation Trust Fund to support the activities referred to in paragraphs 2, 3 and 4 and agrees that a contributor may specify that its contributions be used for purposes specified in paragraphs 2, 3 or 4;

9. Requests the Expanded Bureau, in consultation with interested Parties and stakeholders, to prepare and issue interim guidelines as soon as possible for the Secretariat to implement the tasks assigned to it by the present decision and agrees that the guidelines will be submitted to the Conference of the Parties at its sixth meeting for adoption; that these guidelines will include provisions for the recovery, from sources such as liable parties and providers of financial assurance, of funds paid by the Technical Cooperation Trust Fund under paragraphs 2 and 3; that such recovered funds may be used for purposes set forth in paragraphs 2, 3 and 4, while respecting the original earmarking where appropriate;

10. Urges Parties to cooperate and provide advisory services, technical support and equipment for the purpose of responding to damage involving the transboundary movement of hazardous wastes and other wastes and their disposal;

11. Urges each Party which has not yet done so to establish a national system for responding promptly and effectively to incidents occurring during transboundary movement of hazardous wastes and their disposal;

12. Decides that the Secretariat shall present through the Expanded Bureau a report for the Conference of the Parties at its sixth meeting on implementation of the present decision.

V/33. ENVIRONMENTALLY SOUND MANAGEMENT

The Conference

Welcoming the Basel Declaration on Environmentally Sound Management and reaffirming the objectives set out therein,

1. Decides that, for the next decade of the Basel Convention, the following activities should be undertaken to achieve the objectives of environmentally sound management in the following fields:

(a) Prevention, minimization, recycling, recovery and disposal of hazardous and other wastes subject to the Basel Convention, taking into account social, technological and economic concerns:

Elaboration of a concept and a programme for the environmentally sound management of hazardous and other wastes, with an emphasis on waste prevention and minimization, taking into account the different regional and sectoral capabilities or specificities; promotion of initiatives in all States and at all levels to encourage environmentally sound waste management, in partnership with government authorities at all levels and with stakeholders, including capacity-building, awareness-raising and education;

Promotion of financial and other economic instruments or concepts, with a view to identifying sustainable and self-sufficient solutions for the minimization and environmentally sound and efficient management of hazardous and other wastes subject to the Basel Convention, bearing in mind that such instruments should be affordable and socially acceptable, as well as economically viable; and the exchange of information on such instruments and their application;

(b) Active promotion and use of cleaner technologies with the aim of the prevention and minimization of hazardous and other wastes subject to the Basel Convention:

Cooperation of the regional and subregional centres for training and technology transfer with cleaner production centres and similar institutions having experience and expertise in areas related to the minimization and management of hazardous and other wastes subject to the Basel Convention, for the purpose of sharing information and knowledge and streamlining activities;

(c) Further reduction of the transboundary movements of hazardous and other wastes subject to the Basel Convention, taking into account the need for efficient management, the principles of self-sufficiency and proximity and the priority requirements for recovery and recycling:

Consistent with the technological needs of the Parties, promotion of initiatives aimed at reducing transboundary movements to the minimum, taking into account the environmentally sound management of the wastes, the protection of human health, the principles of proximity and self-sufficiency and the priority requirement of recovery and recycling;

(d) Prevention and monitoring of illegal traffic:

Continued cooperation with the International Criminal Police Organization and the World Customs Organization, in particular, in the training of customs and enforcement officers in order to identify, monitor and prevent illegal traffic in hazardous and other wastes subject to the Basel Convention;

Adoption of procedures to address alleged cases of illegal traffic and to assist Parties in preventing, identifying, monitoring and resolving illegal traffic;

Institutional strengthening of the regional and subregional centres for training and technology transfer, to enable Parties to prevent and monitor illegal traffic;

(e) Improvement and promotion of institutional and technical capacity-building, and development, and of the transfer of environmentally sound technologies, especially for developing countries and countries with economies in transition:

With regard to capacity-building and assistance in legal and institutional matters, the development and effective implementation of legal instruments, building and strengthening of institutional infrastructures for the environmentally sound management of hazardous and other wastes subject to the Basel Convention and their minimization and the control of their transboundary movements;

With regard to capacity-building and assistance in technical matters, assisting in building and improving installations for the treatment of hazardous and other wastes subject to the Basel Convention and the transfer of know-how and technology; and the advancement and improvement of strategies for the practical implementation of the minimization and environmentally sound management of both domestically generated wastes and wastes subject to transboundary movements that would include appropriate tools, measures and incentives especially for use by developing countries and countries with economies in transition, taking into account the needs of small and medium-sized enterprises;

(f) Further development of regional and subregional centres for training and technology transfer:

Establishment or strengthening of the activities of regional and subregional centres for training and technology transfer, to ensure their important role in the implementation of the Basel Convention and of

minimization methods and the environmentally sound management of hazardous and other wastes subject to the Basel Convention, aiming at financial self-sufficiency, bearing in mind that the role and activities of different regional centres in information exchange are to be consolidated and made available to all stakeholders and that regional centres should progressively become involved in activities related to training, public awareness and the exchange of information on waste minimization and environmentally sound technology and expertise;
Collection and dissemination of information on existing examples, in particular in developing countries and countries with economies in transition, of best practices in waste management;

Facilitation of different partnerships where so required, including partnerships with industry, for the development of minimization methods and environmentally sound waste-management solutions;

(g) Enhancement of information exchange, education and awareness-raising in all sectors of society:

Enhancement of the existing information system developed by the secretariat, including improved access, in order to disseminate the knowledge and experience gained in the implementation of the Basel Convention;

Development and operation of a worldwide information system to provide information on available expertise and solutions for waste-related problems and to strengthen the role of the regional centres in these efforts;

Training of the staff of competent authorities, enforcement officers and other key actors (e.g., generators, transporters, disposers, recyclers), where needed, bearing in mind that such training is required to implement the environmentally sound management of hazardous wastes, in particular, controls for transboundary movements, and the monitoring and prevention of illegal traffic in hazardous and other wastes and that it could include, inter alia, in-house training in partnership between government authorities and industry, as well as practice-oriented seminars and workshops, and that the capacities and experience of the regional centres for training and technology transfer should be fully utilized and enhanced;

Promotion of public education and awareness on waste-related issues, in particular at the regional, subregional and local levels, involving all stakeholders, as well as educational institutions, bearing in mind that such efforts may include information campaigns related to waste minimization and the environmentally sound management of hazardous and other wastes subject to the Basel Convention;

(h) Cooperation and partnership at all levels between countries, public authorities, international organizations, the industry sector, non-governmental organizations and academic institutions:

Enhancement of partnership with all stakeholders, to include the various experiences, needs and interests of different regions and sectors for the implementation of the Basel Convention; encouragement of and provision of incentives to the private and public sectors to cooperate with other stakeholders and to contribute experience and expertise in the management of hazardous and other wastes subject to the Basel Convention, including the application of cleaner technologies;

Enhancement of cooperation between the secretariat and international organizations active in areas relevant to the implementation of the Basel Convention and its amendments, bearing in mind that this is to include cooperation with United Nations bodies active in the field of sustainable development, to encourage the incorporation of policies on the environmentally sound management of hazardous wastes in Parties' national environmental management and sustainable development plans and cooperation with the relevant programmes on cleaner production, such as with the joint programme on cleaner production of the United Nations Environment Programme and the United Nations Industrial Development Organization; launching of joint activities and projects in cooperation with organizations such as the United Nations Environment Programme and the Food and Agriculture Organization of the United

Nations in areas of common interest, in particular, on persistent organic pollutants, waste pesticides and other chemical wastes;

(i) Development of mechanisms for compliance with and the monitoring and effective implementation of the Convention and its amendments:

Promotion of the effective implementation of and compliance with the obligations of the Convention and its amendments and the provision of assistance to the Parties as required;

Completion of work on mechanisms designed to facilitate and monitor compliance and implementation of the Convention, bearing in mind that this is to include a mechanism for compliance monitoring, procedures for dispute settlement and guidelines to assist States to prevent, identify and resolve cases of illegal traffic, for consideration by the Conference of the Parties at its sixth meeting;

2. Requests the Technical Working Group to work on the selection of waste streams in countries or regions, for the purpose of developing pilot projects on the state of the art in the field of cleaner production and the environmentally sound management of hazardous and other wastes, including the development of contingency emergency plans;

3. Further decides that, in order to implement these activities, access to financial resources and mechanisms is essential and that, accordingly, the following activities should be undertaken:

(a) Development of projects in cooperation with the United Nations Environment Programme for funding by international entities such as the Global Environment Facility and the facilitation of access to other international financial mechanisms;

(b) Encouragement of the development of financial strategies that will harness market forces to promote environmentally sound management and waste minimization and provide opportunities for investment in this field;

(c) Development of a financial strategy for the operations and activities of the Convention, including innovative methods of fund-raising;

4. Requests the subsidiary bodies of the Conference of the Parties, under the guidance of the Expanded Bureau, further to elaborate and to prioritize the activities for the years 2000-2002 listed in the table attached to the present decision and to start working towards implementing the above objectives as soon as feasible, pending the elaboration and adoption of the work programme;

5. Also requests the subsidiary bodies to prepare a strategic plan, including an indicative work programme, for the period to the year 2010, to address the objectives set forth in the present decision, and to develop a work programme by areas of work based on the present decision for the years 2003-2004, for consideration and adoption by the Conference of the Parties at its sixth meeting;

6. Requests the subsidiary bodies to provide periodic information to the Conference of the Parties on the progress of implementation of the agenda for the next decade on environmentally sound management;

7. Requests the secretariat to collect and disseminate the information needed for the tasks set out above and to coordinate the contacts with the partners involved;

8. Invites Parties to provide comments to the secretariat on the attached table by the end of February 2000.

Table

PROPOSED PRIORITY ACTIVITIES

	Proposal	**Objective**	**Method**	**Outcome**
(a)	Dakar II (2000)	To further define the concept of, and identify opportunities for, environmentally sound management in the areas of waste minimization, reduction, recycling and disposal, To provide a forum that will facilitate exchange of information and experience on environmentally sound management. To enhance partnership with all stakeholders	An international conference hosted by the Government of Senegal and the subregional centre for training and technology transfer in Dakar to bring together key stakeholders, such as Governments, industry, civil society and intergovernmental agencies	• Exchange of information and experience on the practical implementation of the concept of environmentally sound management • To act as a basis for the further development of other workshops as given in (b)

	Proposal	Objective	Method	Outcome
(b)	International workshops (2000-2002) on: (i) hazardous waste minimization initiatives (ii) environmentally sound recovery/ recycling initiatives (iii) environmentally sound disposal	To build on outcome from Dakar II	Workshops to bring together key stakeholders and experts to highlight best practice through, for example, the identification of appropriate technologies, including site visits, information exchange and case studies	• Exchange of information and experience on the practical implementation of the concept of environmentally sound management with focus on each of the themes identified
(c)	Development of methodolo-gies for environment-ally sound management	Develop methods for the environmentally sound management of specific waste streams.	The methods will be developed through the establishment of five case studies, information exchange in the form of questionnaires, and in cooperation with Parties and intergovernmental organizations	• Methodologies for environmentally sound management for specific waste streams developed • Dissemination of these methodologies to Parties

	Proposal	Objective	Method	Outcome
(d)	Economic instruments	To find out how economic instruments (e.g. fiscal and investment policies or programmes) can contribute to environmentally sound management	In cooperation with Parties, UNEP, UNCTAD, OECD, and other relevant bodies: (i) Undertake a survey on economic instruments used and experiences with economic instruments; (ii) Undertake four case studies to find out how the economic instruments can contribute to specific elements of environmentally sound management through: • Stimulating waste minimization; • Increasing collection and environmental sound treatment of waste; • Promoting recycling over disposal	• Provide reference material for the Parties in the formulation of economic measures for environmentally sound management

	Proposal	Objective	Method	Outcome
(e)	Cooperation with United Nations bodies and intergovernmental organizations	To continue to develop and/or enhance synergies with each partner for a more efficient use of resources and to share experiences on environmentally sound management and cleaner technology	Develop joint activities in full collaboration with Parties Periodic assessment of accomplishments to date on these initiatives and identification of new ones	• Concrete outputs for use by Governments, the private sector and non-governmental organizations • More efficient use of resources • Sharing of experiences and enhancement of outputs with respect to their quality and effectiveness
(f)	Electronic information systems	To develop electronic information systems on environmentally sound management to help Parties gain access to information	Enhancement of existing information systems to highlight environmentally sound management Provision of the necessary technologies and access to these systems	• Access to electronic information systems • Information transfer and exchange • Increased awareness of issues

	Proposal	Objective	Method	Outcome
(g)	Institutional and technological capacity-building	To build up institutional and technological capacity	• Carrying out of an inventory of institutional and technological needs of Parties • Training and making available expertise by the Secretariat to the Parties, for example, through particular expertise of regional centres	• Report on institutional and technological needs of Parties • Improved institutional capacity • Improved technological capacity
(h)	Training of enforcement officers	To provide training for customs and other enforcement officers	Cooperation with Parties, INTERPOL, WCO and other international organizations working in this field, to develop training materials, establish training programmes and raise awareness which would be implemented through three workshops	• Appropriately trained customs and enforcement officers • Prevention of illegal traffic in hazardous waste • Improved control of the transboundary movement of hazardous waste

	Proposal	Objective	Method	Outcome
(i)	Inventory of generation and stockpiles of hazardous waste	To develop inventories of hazardous waste to establish a baseline in what is generated and what is stockpiled	Assistance to conduct inventories to assist Parties in the development of these inventories	• Inventories • Baselines • Prioritization • Information base/expertise to be used to develop management plans/strategies
(j)	Cooperation and partnership	To enhance partnership arrangements with the private sector, non-governmental organizations, academia, and local communities for the promotion of environmentally sound management	Development of information resource networks	• Resource material • Better informed partners • Information exchange and increased awareness of issues

	Proposal	Objective	Method	Outcome
(k)	Strengthening of regional and subregional centres for training and technology transfer	To support training and technology transfer activities at regional and subregional levels for environmentally sound management	Involvement and participation in activities designed to promote the objectives of the regional and subregional centres These activities are to be developed in full collaboration with the Parties in the region and/or subregion	• Development of, and increase in, knowledge base • Transfer of technology • Training to improve control of the transboundary movement of hazardous waste • Waste minimization

V/34. INSTITUTIONAL ARRANGEMENTS

The Conference

Recalling paragraph 5 (e) of article 15 of the Basel Convention, stipulating that the Conference of the Parties shall establish such subsidiary bodies as are deemed necessary for the implementation of the Convention,

Also recalling its decisions I/5, I/2, I/16, II/11, II/27 and III/28, which established the subsidiary bodies of the Convention,

Having considered the experience of the work of the subsidiary bodies,

1. Decides to reorganize the subsidiary bodies of the Convention in the following manner:

(a) Expanded Bureau;

(b) Working Group for Implementation;

(c) Technical Working Group;

(d) Legal Working Group;

2. Also decides that the Expanded Bureau will be composed of thirteen members: five members of the present Bureau; five members of the Bureau of the previous meeting of the Conference of the Parties; the Chair of the Working Group for Implementation; the Chair of the Technical Working Group; and the Chair of the Legal Working Group, and that should a national of one Party occupy more than one position on the Expanded Bureau, the relevant regional group may nominate a representative of another Party to fill the additional position;

2. Further decides that, within the policy agreed by the Conference of the Parties, the Expanded Bureau will have the following mandate:

(a) To provide general policy and general operational directions to the secretariat between meetings of the Conference of the Parties;

(b) To provide guidance and advice to the secretariat on the preparation of agendas and other requirements of meetings and on any other matters brought to it by the secretariat in the exercise of its function;

(c) To oversee the development and execution of the secretariat's budget as derived from the trust funds and other sources, and also all aspects of fund-raising undertaken by the secretariat;

(d) To perform functions requested by the Working Group for Implementation, especially administrative tasks, taking into account the need for the rational use of limited financial resources available under the Basel Convention trust funds;

(e) To receive, every six months, reports from the Executive Secretary of the secretariat of the Basel Convention on all sources of income received, including carry-over, plus actual provisional expenditures and commitments;

(f) To receive, every six months, information from the Executive Director of the United Nations Environment Programme, through the Executive Secretary, on all sources of income received on the trust funds of the Basel Convention, including carry-over, plus actual provisional expenditures and commitments related to those trust funds;

(g) To keep under review the information provided under subparagraphs 3 (e) and 3 (f);

(h) To report to the Conference of the Parties on the activities it has carried out between meetings of the Conference of the Parties;

(i) to perform any other functions as may be entrusted to it by the Conference of the Parties;

4. Decides that the Working Group for Implementation will take over the role currently performed by the Open-ended Ad Hoc Committee for Implementation and that the Working Group for Implementation will be composed of the representatives of all the Parties interested and will have the following mandate:

(a) To prepare draft decisions for consideration by the Conference of the Parties;

(b) To consider matters related to the budget of the Basel Convention;

(c) To consider matters related to the bilateral, multilateral and regional agreements or arrangements;

(d) To examine the reports submitted by the Parties in accordance with the requirements of article 13 of the Basel Convention;

(e) To identify the specific needs of different regions and subregions for training and technology transfer and to consider ways and means of ensuring the establishment and functioning of the regional centres for training and technology transfer;

(f) To prepare, analyse and revise, as necessary, materials to assist Parties in the implementation of the Basel Convention;

(g) To analyse the information management system of the Basel Convention;

(h) To perform any other functions as may be entrusted to it by the Conference of the Parties;

5. Decides also that the Working Group for Implementation may request the Expanded Bureau to perform, on an ad hoc basis, some of its functions;

6. Requests the secretariat to prepare a draft work programme for consideration and adoption by the Working Group for Implementation at its first meeting;

7. Decides that the Technical Working Group will be composed of the representatives of all the Parties interested and will have the following mandate:

(a) To perform the functions of the classification and hazard characterization of wastes, encompassing, inter alia, the responsibility for the review or adjustment of the lists of wastes contained in Annexes VIII and IX of the Convention;

(b) To prepare technical guidelines and guidance materials for the environmentally sound management of wastes covered by the Convention and of disposal operations;

(c) To examine scientific, technical and other relevant implications of the implementation of the Basel Convention;

(d) To work on the harmonization of the lists of wastes and procedures, as appropriate, of the Basel Convention with the Harmonized System of the World Customs Organization and existing international and regional systems dealing with the control of transboundary movements of wastes and hazardous wastes, and with the intergovernmental process on the global harmonization of systems of classification and labelling of chemicals;

(e) To provide guidance on technical issues relating to wastes and hazardous wastes, including the disposal of end-of-life equipment and post-consumer goods, on hazardous wastes minimization and on the relationship with other conventions in related fields and with international organizations with related interests;

(f) To perform any other technical tasks as may be entrusted to it by the Conference of the Parties.

8. Decides that the Legal Working Group will take over the role currently performed by the Consultative Subgroup of Legal and Technical Experts and that the Legal Working Group will be composed of the representatives of all the Parties interested and will have the following mandate:

(a) To keep on its agenda the issues related to establishing an emergency fund, including elements required for its establishment with a view to elaborating on the establishment of an emergency fund mechanism that meets the needs of the Parties;

(b) To cooperate closely with the Technical Working Group to finalize the draft guidance elements for bilateral, multilateral and regional agreements concluded under article 11 of the Basel Convention;

(c) To explore issues relating to Annex VII and, in cooperation with the Technical Working Group, to provide Parties with a detailed and documented analysis that would highlight issues related to Annex VII;

(d) To develop procedures to address alleged cases of illegal traffic;

(e) To develop, in cooperation with the Technical Working Group, recommended procedures to assist Parties in preventing, identifying and managing illegal traffic;

(f) To prepare a proposal for establishing a mechanism for promoting implementation and compliance with the obligations set out by the Basel Convention;

(g) To examine the dispute settlement mechanism that exists under article 20 of the Basel Convention and to consider whether it continues to meet the needs of the Parties to the Convention;

(h) To analyse the legal aspects under the Basel Convention relating to the issue of full and partial dismantling of ships;

(i) To perform any other legal tasks as may be entrusted to it by the Conference of the Parties;

9. Further decides that the Working Group for Implementation, Technical Working Group and Legal Working Group may organize joint meetings for the consideration of issues that relate to the mandate of more than one group;

10. Also decides that the subsidiary bodies, separately or jointly, may establish, as necessary and appropriate, during the meetings small task groups, with equitable geographic representation, to perform specific tasks on an ad hoc basis.

V/35. FINANCIAL ARRANGEMENTS

The Conference

Recalling decision IV/22 of the fourth meeting of the Conference of the Parties,

Noting with appreciation the comprehensive information provided on the trust funds of the Basel Convention by the secretariat,

1. Approves the budget for the Trust Fund for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in the amount of 4,201,854 United States dollars for 2001 and 4,201,854 United States dollars for 2002 as contained in annex I to the present decision, reduces the reserve and fund balance for the years 2001 and 2002 by 1,200,000 United States dollars per annum and establishes the level of contributions accordingly. The contributions by the Parties are allocated according to the tables in annex II to the present decision;

2. Notes the continued increase in the level of reserve and fund balance in the Trust Fund for the Implementation of the Basel Convention;

3. Requests the secretariat to seek guidance from the Expanded Bureau to work towards a reduction in the reserve and fund balance to a level that is consistent with the practice of the United Nations and in line with the framework of its financial rules and regulations;

4. Expresses its concern over the delays in payment of the agreed contributions by Parties, contrary to the provisions of the terms of reference for the administration of the trust funds for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, as contained in paragraph 12 of annex II to decision I/7 of the first meeting of the Conference of the Parties;

5. Takes note of the budget for the Technical Cooperation Trust Fund to assist developing countries and other countries in need of technical assistance in the implementation of the Basel Convention to the amount of 2,175,250 United States dollars for 2001 and 2,175,250 United States dollars for 2002 as contained in annex III to the present decision;

6. Recognizes that voluntary contributions are essential for the effective implementation of the Convention and invites voluntary contributions to the Technical Cooperation Trust Fund to assist developing countries and other countries in need of technical assistance and to the Trust Fund for the Implementation of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal from Parties and non-Parties, as well as from other sources;

7. Invites Parties to notify the secretariat of the Basel Convention of all contributions made to the Basel Convention trust funds at the time such payments are made;

8. Requests the secretariat of the Basel Convention to ensure the implementation of all decisions adopted by the Conference of the Parties as approved within the budgets for 2001 and 2002 ;

9. Requests the Executive Secretary of the Basel Convention to report every six months to the Expanded Bureau on all sources of income received, including the reserve and fund balance, as well as actual provisional

and projected expenditure and commitments; and further requests the Executive Secretary to report all expenditure against the agreed budget lines;

10. Requests the Expanded Bureau to keep under review the financial information provided by the secretariat including the timeliness and transparency of this information;

11. Requests the secretariat to prepare an updated version of the terms of reference for the administration of the Trust Funds for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal for consideration by the Working Group for Implementation and adoption by the Conference of the Parties at its sixth meeting;

12. Authorizes the Executive Secretary, in addition to the approved budgets, on an exceptional basis to utilize an amount not exceeding 900,000 United States dollars in the three year period 2000-2002 from the reserve and fund balance of the Trust Fund for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal for the purpose of implementing prioritized activities relating to the Basel Declaration and decision V/33 on Environmentally Sound Management and requests the Expanded Bureau to keep such implementation under review and the Executive Secretary to submit a financial report on the implementation to the Conference of the Parties at its sixth meeting.

V/36. TRIBUTE TO THE HOST COUNTRY

The Conference

Having met in Basel from 6 to 10 December 1999, the tenth anniversary of the signing of the Basel Convention,

Extends its gratitude to the Government of Switzerland for the organization of the fifth meeting of the Conference of the Parties and to the people of Basel for the warm hospitality accorded to all delegates at the meeting.

Annex II

BASEL DECLARATION ON ENVIRONMENTALLY SOUND MANAGEMENT

We, the Ministers and other heads of delegation from the Parties to the Basel Convention and from other States,

Having met in Basel, Switzerland, from 6 to 10 December 1999, on the occasion of the fifth meeting of the Conference of the Parties to the Basel Convention and the tenth anniversary of the adoption of the Basel Convention,

Concerned about the continuing risk of damage to the environment and of harmful effects on human health caused by the environmentally unsound management of hazardous wastes,

Recognizing that, notwithstanding the concerted efforts made during the first decade of the Basel Convention, hazardous waste generation has continued to grow at the global level and transboundary movements of hazardous wastes are still a matter for concern,

Further recognizing the importance of partnership with the private sector and non-governmental organizations,

Building on the achievements of the first decade of the Convention,

1. Assert a vision that the environmentally sound management of hazardous and other wastes is accessible to all Parties, emphasizing the minimization of such wastes and the strengthening of capacity-building;

2. Conclude that, having reviewed progress in the implementation and further development of the Basel Convention during its first decade, significant achievements have been made, such as the development and adoption of the control system for transboundary movements; the waste lists and model legislation; the adoption of the ban amendment; and the establishment of regional and subregional centres for training and technology transfer and also note with satisfaction that the number of Parties has greatly increased since the entry into force of the Convention;

3. Reaffirm the fundamental aims of the Basel Convention, namely, the reduction of transboundary movements of hazardous and other wastes subject to the Basel Convention, the prevention and minimization of their generation, the environmentally sound management of such wastes and the active promotion of the transfer and use of cleaner technologies;

4. Reiterate our commitment to sustainable development and full support for the implementation of the Rio Declaration, Agenda 21 and the programme for its further implementation adopted by the United Nations General Assembly at its nineteenth special session in 1997;

5. Undertake to make all possible efforts to ensure the universality of the Convention by promoting the ratification of or accession to the Convention and its amendments and by ensuring effective implementation of and compliance with its obligations;

6. Recognize the need to focus our activities within the next decade on specific actions to promote the implementation of the Convention and its amendments worldwide, at all levels, and, to this end, agree to enhance and strengthen our efforts and cooperation to achieve environmentally sound management in the following fields:

(a) Prevention, minimization, recycling, recovery and disposal of hazardous and other wastes subject to the Basel Convention, taking into account social, technological and economic concerns;

(b) Active promotion and use of cleaner technologies and production, with the aim of the prevention and minimization of hazardous and other wastes subject to the Basel Convention;

(c) Further reduction of transboundary movements of hazardous and other wastes subject to the Basel Convention, taking into account the need for efficient management, the principles of self-sufficiency and proximity and the priority requirement of recovery and recycling;

(d) Prevention and monitoring of illegal traffic;

(e) Improvement and promotion of institutional and technical capacity-building, as well as the development and transfer of environmentally sound technologies, especially for developing countries and countries with economies in transition;

(f) Further development of regional and subregional centres for training and technology transfer;

(g) Enhancement of information exchange, education and awareness-raising in all sectors of society;

(h) Cooperation and partnership at all levels between countries, public authorities, international organizations, the industry sector, non-governmental organizations and academic institutions;

(i) Development of mechanisms for compliance with and for the monitoring and effective implementation of the Convention and its amendments;

7. Support the development of pilot projects on state-of-the-art or best available technologies to demonstrate the environmentally sound management of hazardous wastes and their minimization, including those financed by public or private partnership, in selected countries or regions, taking into account the needs of small and medium-sized enterprises, and agree that these pilot projects will take into consideration issues related to the environmentally sound disposal of stockpiles of hazardous wastes;

8. Recognize the need for a sound financial basis for the effective implementation of these activities and for increased efforts to gain access to all sources of funding, including international financial institutions, and recognize, in addition, the need to develop strategies that will harness market forces to promote waste minimization and environmentally sound management and to provide opportunities for investment in this field;

9. Agree that decision V/33 of the Conference of the Parties constitutes our agenda for the next decade on environmentally sound management.

Annex III

PROTOCOL ON LIABILITY AND COMPENSATION FOR DAMAGE RESULTING FROM TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

The Parties to the Protocol,

Having taken into account the relevant provisions of Principle 13 of the 1992 Rio Declaration on Environment and Development, according to which States shall develop international and national legal instruments regarding liability and compensation for the victims of pollution and other environmental damage,

Being Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal,

Mindful of their obligations under the Convention,

Aware of the risk of damage to human health, property and the environment caused by hazardous wastes and other wastes and the transboundary movement and disposal thereof,

Concerned about the problem of illegal transboundary traffic in hazardous wastes and other wastes,

Committed to Article 12 of the Convention, and emphasizing the need to set out appropriate rules and procedures in the field of liability and compensation for damage resulting from the transboundary movement and disposal of hazardous wastes and other wastes,

Convinced of the need to provide for third party liability and environmental liability in order to ensure that adequate and prompt compensation is available for damage resulting from the transboundary movement and disposal of hazardous wastes and other wastes,

Have agreed as follows:

Article 1

Objective

The objective of the Protocol is to provide for a comprehensive regime for liability and for adequate and prompt compensation for damage resulting from the transboundary movement of hazardous wastes and other wastes and their disposal including illegal traffic in those wastes.

Article 2

Definitions

1. The definitions of terms contained in the Convention apply to the Protocol, unless expressly provided otherwise in the Protocol.

2. For the purposes of the Protocol:

(a) "The Convention" means the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal;

(b) "Hazardous wastes and other wastes" means hazardous wastes and other wastes within the meaning of Article 1 of the Convention;

(c) "Damage" means:

(i)Loss of life or personal injury;

(ii)Loss of or damage to property other than property held by the person liable in accordance with the present Protocol;

(iii)Loss of income directly deriving from an economic interest in any use of the environment, incurred as a result of impairment of the environment, taking into account savings and costs;

(iv)The costs of measures of reinstatement of the impaired environment, limited to the costs of measures actually taken or to be undertaken; and

(v)The costs of preventive measures, including any loss or damage caused by such measures, to the extent that the damage arises out of or results from hazardous properties of the wastes involved in the transboundary movement and disposal of hazardous wastes and other wastes subject to the Convention;

(d) "Measures of reinstatement" means any reasonable measures aiming to assess, reinstate or restore damaged or destroyed components of the environment. Domestic law may indicate who will be entitled to take such measures;

(e) "Preventive measures" means any reasonable measures taken by any person in response to an incident, to prevent, minimize, or mitigate loss or damage, or to effect environmental clean-up;

(f) "Contracting Party" means a Party to the Protocol;

(g) "Protocol" means the present Protocol;

(h) "Incident" means any occurrence, or series of occurrences having the same origin that causes damage or creates a grave and imminent threat of causing damage;

(i) "Regional economic integration organization" means an organization constituted by sovereign States to which its member States have transferred competence in respect of matters governed by the Protocol and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve, formally confirm or accede to it;

(j) "Unit of account" means the Special Drawing Right as defined by the International Monetary Fund.

Article 3

Scope of application

1. The Protocol shall apply to damage due to an incident occurring during a transboundary movement of hazardous wastes and other wastes and their disposal, including illegal traffic, from the point where the wastes are loaded on the means of transport in an area under the national jurisdiction of a State of export. Any Contracting Party may by way of notification to the Depositary exclude the application of the Protocol, in respect of all transboundary movements for which it is the State of export, for such incidents which occur in an area under its national jurisdiction, as regards damage in its area of national jurisdiction. The Secretariat shall inform all Contracting Parties of notifications received in accordance with this Article.

2. The Protocol shall apply:

(a) In relation to movements destined for one of the operations specified in Annex IV to the Convention other than D13, D14, D15, R12 or R13, until the time at which the notification of completion of disposal pursuant to Article 6, paragraph 9, of the Convention has occurred, or, where such notification has not been made, completion of disposal has occurred; and

(b) In relation to movements destined for the operations specified in D13, D14, D15, R12 or R13 of Annex IV to the Convention, until completion of the subsequent disposal operation specified in D1 to D12 and R1 to R11 of Annex IV to the Convention.

3. (a) The Protocol shall apply only to damage suffered in an area under the national jurisdiction of a Contracting Party arising from an incident as referred to in paragraph 1;

(b) When the State of import, but not the State of export, is a Contracting Party, the Protocol shall apply only with respect to damage arising from an incident as referred to in paragraph 1 which takes place after the moment at which the disposer has taken possession of the hazardous wastes and other wastes. When the State of export, but not the State of import, is a Contracting Party, the Protocol shall apply only with respect to damage arising from an incident as referred to in paragraph 1 which takes place prior to the moment at which the disposer takes possession of the hazardous wastes and other wastes. When neither the State of export nor the State of import is a Contracting Party, the Protocol shall not apply;

(c) Notwithstanding subparagraph (a), the Protocol shall also apply to the damages specified in Article 2, subparagraphs 2 (c) (i), (ii) and (v), of the Protocol occurring in areas beyond any national jurisdiction;

(d) Notwithstanding subparagraph (a), the Protocol shall, in relation to rights under the Protocol, also apply to damages suffered in an area under the national jurisdiction of a State of transit which is

not a Contracting Party provided that such State appears in Annex A and has acceded to a multilateral or regional agreement concerning transboundary movements of hazardous waste which is in force. Subparagraph (b) will apply mutatis mutandis.

4. Notwithstanding paragraph 1, in case of re-importation under Article 8 or Article 9, subparagraph 2 (a), and Article 9, paragraph 4, of the Convention, the provisions of the Protocol shall apply until the hazardous wastes and other wastes reach the original State of export.

5. Nothing in the Protocol shall affect in any way the sovereignty of States over their territorial seas and their jurisdiction and the right in their respective exclusive economic zones and continental shelves in accordance with international law.

6. Notwithstanding paragraph 1 and subject to paragraph 2 of this Article:

(a) The Protocol shall not apply to damage that has arisen from a transboundary movement of hazardous wastes and other wastes that has commenced before the entry into force of the Protocol for the Contracting Party concerned;

(b) The Protocol shall apply to damage resulting from an incident occurring during a transboundary movement of wastes falling under Article 1, subparagraph 1 (b), of the Convention only if those wastes have been notified in accordance with Article 3 of the Convention by the State of export or import, or both, and the damage arises in an area under the national jurisdiction of a State, including a State of transit, that has defined or considers those wastes as hazardous provided that the requirements of Article 3 of the Convention have been met. In this case strict liability shall be channelled in accordance with Article 4 of the Protocol.

(a) The Protocol shall not apply to damage due to an incident occurring during a transboundary movement of hazardous wastes and other wastes and their disposal pursuant to a bilateral, multilateral or regional agreement or arrangement concluded and notified in accordance with Article 11 of the Convention if:

(i)The damage occurred in an area under the national jurisdiction of any of the Parties to the agreement or arrangement;

(ii)There exists a liability and compensation regime, which is in force and is applicable to the damage resulting from such a transboundary movement or disposal provided it fully meets, or exceeds the objective of the Protocol by providing a high level of protection to persons who have suffered damage;

(iii)The Party to the Article 11 agreement or arrangement in which the damage has occurred has previously notified the Depositary of the non-application of the Protocol to any damage occurring in an area under its national jurisdiction due to an incident resulting from movements or disposals referred to in this subparagraph; and

(iv)The Parties to the Article 11 agreement or arrangement have not declared that the Protocol shall be applicable;

(b) In order to promote transparency, a Contracting Party that has notified the Depositary of the non-application of the Protocol shall notify the Secretariat of the applicable liability and compensation regime referred to in subparagraph (a) (ii) and include a description of the regime. The Secretariat shall submit to the Meeting of the Parties, on a regular basis, summary reports on the notifications received;

(c) After a notification pursuant to subparagraph (a) (iii) is made, actions for compensation for damage to which subparagraph (a) (i) applies may not be made under the Protocol.

8. The exclusion set out in paragraph 7 of this Article shall neither affect any of the rights or obligations under the Protocol of a Contracting Party which is not party to the agreement or arrangement mentioned above, nor shall it affect rights of States of transit which are not Contracting Parties.

9. Article 3, paragraph 2, shall not affect the application of Article 16 to all Contracting Parties.

Article 4

Strict liability

1. The person who notifies in accordance with Article 6 of the Convention, shall be liable for damage until the disposer has taken possession of the hazardous wastes and other wastes. Thereafter the disposer shall be liable for damage. If the State of export is the notifier or if no notification has taken place, the exporter shall be liable for damage until the disposer has taken possession of the hazardous wastes and other wastes. With respect to Article 3, subparagraph 6 (b), of the Protocol, Article 6, paragraph 5, of the Convention shall apply mutatis mutandis. Thereafter the disposer shall be liable for damage.

2. Without prejudice to paragraph 1, with respect to wastes under Article 1, subparagraph 1 (b), of the Convention that have been notified as hazardous by the State of import in accordance with Article 3 of the Convention but not by the State of export, the importer shall be liable until the disposer has taken possession of the wastes, if the State of import is the notifier or if no notification has taken place. Thereafter the disposer shall be liable for damage.

3. Should the hazardous wastes and other wastes be re-imported in accordance with Article 8 of the Convention, the person who notified shall be liable for damage from the time the hazardous wastes leave the disposal site, until the wastes are taken into possession by the exporter, if applicable, or by the alternate disposer.

4. Should the hazardous wastes and other wastes be re-imported under Article 9, subparagraph 2 (a), or Article 9, paragraph 4, of the Convention, subject to Article 3 of the Protocol, the person who re-imports shall be held liable for damage until the wastes are taken into possession by the exporter if applicable, or by the alternate disposer.

5. No liability in accordance with this Article shall attach to the person referred to in paragraphs 1 and 2 of this Article, if that person proves that the damage was:

(a) The result of an act of armed conflict, hostilities, civil war or insurrection;

(b) The result of a natural phenomenon of exceptional, inevitable, unforeseeable and irresistible character;

(c) Wholly the result of compliance with a compulsory measure of a public authority of the State where the damage occurred; or

(d) Wholly the result of the wrongful intentional conduct of a third party, including the person who suffered the damage.

6. If two or more persons are liable according to this Article, the claimant shall have the right to seek full compensation for the damage from any or all of the persons liable.

Article 5

Fault-based liability

Without prejudice to Article 4, any person shall be liable for damage caused or contributed to by his lack of compliance with the provisions implementing the Convention or by his wrongful intentional, reckless or negligent acts or omissions. This Article shall not affect the domestic law of the Contracting Parties governing liability of servants and agents.

Article 6

Preventive measures

1. Subject to any requirement of domestic law any person in operational control of hazardous wastes and other wastes at the time of an incident shall take all reasonable measures to mitigate damage arising therefrom.

2. Notwithstanding any other provision in the Protocol, any person in possession and/or control of hazardous wastes and other wastes for the sole purpose of taking preventive measures, provided that this person acted reasonably and in accordance with any domestic law regarding preventive measures, is not thereby subject to liability under the Protocol.

Article 7

Combined cause of the damage

1. Where damage is caused by wastes covered by the Protocol and wastes not covered by the Protocol, a person otherwise liable shall only be liable according to the Protocol in proportion to the contribution made by the wastes covered by the Protocol to the damage.

2. The proportion of the contribution to the damage of the wastes referred to in paragraph 1 shall be determined with regard to the volume and properties of the wastes involved, and the type of damage occurring.

3. In respect of damage where it is not possible to distinguish between the contribution made by wastes covered by the Protocol and wastes not covered by the Protocol, all damage shall be considered to be covered by the Protocol.

Article 8

Right of recourse

1. Any person liable under the Protocol shall be entitled to a right of recourse in accordance with the rules of procedure of the competent court:

(a) Against any other person also liable under the Protocol; and

(b) As expressly provided for in contractual arrangements.

2. Nothing in the Protocol shall prejudice any rights of recourse to which the person liable might be entitled pursuant to the law of the competent court.

Article 9

Contributory fault

Compensation may be reduced or disallowed if the person who suffered the damage, or a person for whom he is responsible under the domestic law, by his own fault, has caused or contributed to the damage having regard to all circumstances.

Article 10

Implementation

1. The Contracting Parties shall adopt the legislative, regulatory and administrative measures necessary to implement the Protocol.

2. In order to promote transparency, Contracting Parties shall inform the Secretariat of measures to implement the Protocol, including any limits of liability established pursuant to paragraph 1 of Annex B.

3. The provisions of the Protocol shall be applied without discrimination based on nationality, domicile or residence.

Article 11

Conflicts with other liability and compensation agreements

Whenever the provisions of the Protocol and the provisions of a bilateral, multilateral or regional agreement apply to liability and compensation for damage caused by an incident arising during the same portion of a transboundary movement, the Protocol shall not apply provided the other agreement is in force for the Party or Parties concerned and had been opened for signature when the Protocol was opened for signature, even if the agreement was amended afterwards.

Article 12

Financial limits

1. Financial limits for the liability under Article 4 of the Protocol are specified in Annex B to the Protocol. Such limits shall not include any interest or costs awarded by the competent court.

2. There shall be no financial limit on liability under Article 5.

Article 13

Time limit of liability

1. Claims for compensation under the Protocol shall not be admissible unless they are brought within ten years from the date of the incident.

2. Claims for compensation under the Protocol shall not be admissible unless they are brought within five years from the date the claimant knew or ought reasonably to have known of the damage provided that the time limits established pursuant to paragraph 1 of this Article are not exceeded.

3. Where the incident consists of a series of occurrences having the same origin, time limits established pursuant to this Article shall run from the date of the last of such occurrences. Where the incident consists of a continuous occurrence, such time limits shall run from the end of that continuous occurrence.

Article 14

Insurance and other financial guarantees

1. The persons liable under Article 4 shall establish and maintain during the period of the time limit of liability, insurance, bonds or other financial guarantees covering their liability under Article 4 of the Protocol for amounts not less than the minimum limits specified in paragraph 2 of Annex B. States may fulfil their obligation under this paragraph by a declaration of self-insurance. Nothing in this paragraph shall prevent the use of deductibles or co-payments as between the insurer and the insured, but the failure of the insured to pay any deductible or co-payment shall not be a defence against the person who has suffered the damage.

2. With regard to the liability of the notifier, or exporter under Article 4, paragraph 1, or of the importer under Article 4, paragraph 2, insurance, bonds or other financial guarantees referred to in paragraph 1 of this Article shall only be drawn upon in order to provide compensation for damage covered by Article 2 of the Protocol.

3. A document reflecting the coverage of the liability of the notifier or exporter under Article 4, paragraph 1, or of the importer under Article 4, paragraph 2, of the Protocol shall accompany the notification referred to in Article 6 of the Convention. Proof of coverage of the liability of the disposer shall be delivered to the competent authorities of the State of import.

3. Any claim under the Protocol may be asserted directly against any person providing insurance, bonds or other financial guarantees. The insurer or the person providing the financial guarantee shall have the right to require the person liable under Article 4 to be joined in the proceedings. Insurers and persons providing financial guarantees may invoke the defences which the person liable under Article 4 would be entitled to invoke.

5. Notwithstanding paragraph 4, a Contracting Party shall, by notification to the Depositary at the time of signature, ratification, or approval of, or accession to the Protocol, indicate if it does not provide for a right to bring a direct action pursuant to paragraph 4. The Secretariat shall maintain a record of the Contracting Parties who have given notification pursuant to this paragraph.

Article 15

Financial mechanism

1. Where compensation under the Protocol does not cover the costs of damage, additional and supplementary measures aimed at ensuring adequate and prompt compensation may be taken using existing mechanisms.

2. The Meeting of the Parties shall keep under review the need for and possibility of improving existing mechanisms or establishing a new mechanism.

Article 16

State responsibility

The Protocol shall not affect the rights and obligations of the Contracting Parties under the rules of general international law with respect to State responsibility.

PROCEDURES

Article 17

Competent courts

1. Claims for compensation under the Protocol may be brought in the courts of a Contracting Party only where either:

(a) The damage was suffered; or

(b) The incident occurred; or

(c) The defendant has his habitual residence, or has his principal place of business.

2. Each Contracting Party shall ensure that its courts possess the necessary competence to entertain such claims for compensation.

Article 18

Related actions

1. Where related actions are brought in the courts of different Parties, any court other than the court first seized may, while the actions are pending at first instance, stay its proceedings.

2. A court may, on the application of one of the Parties, decline jurisdiction if the law of that court permits the consolidation of related actions and another court has jurisdiction over both actions.

3. For the purpose of this Article, actions are deemed to be related where they are so closely connected that it is expedient to hear and determine them together to avoid the risk of irreconcilable judgements resulting from separate proceedings.

Article 19

Applicable law

All matters of substance or procedure regarding claims before the competent court which are not specifically regulated in the Protocol shall be governed by the law of that court including any rules of such law relating to conflict of laws.

Article 20

Relation between the Protocol and the law of the competent court

1. Subject to paragraph 2, nothing in the Protocol shall be construed as limiting or derogating from any rights of persons who have suffered damage, or as limiting the protection or reinstatement of the environment which may be provided under domestic law.

2. No claims for compensation for damage based on the strict liability of the notifier or the exporter liable under Article 4, paragraph 1, or the importer liable under Article 4, paragraph 2, of the Protocol, shall be made otherwise than in accordance with the Protocol.

Article 21

Mutual recognition and enforcement of judgements

1. Any judgement of a court having jurisdiction in accordance with Article 17 of the Protocol, which is enforceable in the State of origin and is no longer subject to ordinary forms of review, shall be recognized in any Contracting Party as soon as the formalities required in that Party have been completed, except:

(a) Where the judgement was obtained by fraud;

(b) Where the defendant was not given reasonable notice and a fair opportunity to present his case;

(c) Where the judgement is irreconcilable with an earlier judgement validly pronounced in another Contracting Party with regard to the same cause of action and the same parties; or

(d) Where the judgement is contrary to the public policy of the Contracting Party in which its recognition is sought.

2. A judgement recognized under paragraph 1 of this Article shall be enforceable in each Contracting Party as soon as the formalities required in that Party have been completed. The formalities shall not permit the merits of the case to be re-opened.

3. The provisions of paragraphs 1 and 2 of this Article shall not apply between Contracting Parties that are Parties to an agreement or arrangement in force on mutual recognition and enforcement of judgements under which the judgement would be recognizable and enforceable.

Article 22

Relationship of the Protocol with the Basel Convention

Except as otherwise provided in the Protocol, the provisions of the Convention relating to its Protocols shall apply to the Protocol.

Article 23

Amendment of Annex B

1. At its sixth meeting, the Conference of the Parties to the Basel Convention may amend paragraph 2 of Annex B following the procedure set out in Article 18 of the Basel Convention.

2. Such an amendment may be made before the Protocol enters into force.

FINAL CLAUSES

Article 24

Meeting of the Parties

1. A Meeting of the Parties is hereby established. The Secretariat shall convene the first Meeting of the Parties in conjunction with the first meeting of the Conference of the Parties to the Convention after entry into force of the Protocol.

2. Subsequent ordinary Meetings of the Parties shall be held in conjunction with meetings of the Conference of the Parties to the Convention unless the Meeting of the Parties decides otherwise. Extraordinary Meetings of the Parties shall be held at such other times as may be deemed necessary by a Meeting of the Parties, or at the written request of any Contracting Party, provided that within six months of such a request being communicated to them by the Secretariat, it is supported by at least one third of the Contracting Parties.

3. The Contracting Parties, at their first meeting, shall adopt by consensus rules of procedure for their meetings as well as financial rules.

4. The functions of the Meeting of the Parties shall be:

(a) To review the implementation of and compliance with the Protocol;

(b) To provide for reporting and establish guidelines and procedures for such reporting where necessary;

(c) To consider and adopt, where necessary, proposals for amendment of the Protocol or any annexes and for any new annexes; and

(d) To consider and undertake any additional action that may be required for the purposes of the Protocol.

Article 25

Secretariat

1. For the purposes of the Protocol, the Secretariat shall:

(a) Arrange for and service Meetings of the Parties as provided for in Article 24;

(b) Prepare reports, including financial data, on its activities carried out in implementation of its functions under the Protocol and present them to the Meeting of the Parties;

(c) Ensure the necessary coordination with relevant international bodies, and in particular enter into such administrative and contractual arrangements as may be required for the effective discharge of its functions;

(d) Compile information concerning the national laws and administrative provisions of Contracting Parties implementing the Protocol;

(e) Cooperate with Contracting Parties and with relevant and competent international organisations and agencies in the provision of experts and equipment for the purpose of rapid assistance to States in the event of an emergency situation;

(f) Encourage non-Parties to attend the Meetings of the Parties as observers and to act in accordance with the provisions of the Protocol; and

(g) Perform such other functions for the achievement of the purposes of this Protocol as may be assigned to it by the Meetings of the Parties.

2. The secretariat functions shall be carried out by the Secretariat of the Basel Convention

Article 26

Signature

The Protocol shall be open for signature by States and by regional economic integration organizations Parties to the Basel Convention in Berne at the Federal Department of Foreign Affairs of Switzerland from 6 to 17 March 2000 and at United Nations Headquarters in New York from 1 April to 10 December 2000.

Article 27

Ratification, acceptance, formal confirmation or approval

1. The Protocol shall be subject to ratification, acceptance or approval by States and to formal confirmation or approval by regional economic integration organizations. Instruments of ratification, acceptance, formal confirmation, or approval shall be deposited with the Depositary.

2. Any organization referred to in paragraph 1 of this Article which becomes a Contracting Party without any of its member States being a Contracting Party shall be bound by all the obligations under the Protocol. In the case of such organizations, one or more of whose member States is a Contracting Party, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Protocol. In such cases, the organization and the member States shall not be entitled to exercise rights under the Protocol concurrently.

3. In their instruments of formal confirmation or approval, the organizations referred to in paragraph 1 of this Article shall declare the extent of their competence with respect to the matters governed by the Protocol. These organizations shall also inform the Depositary, who will inform the Contracting Parties, of any substantial modification in the extent of their competence.

Article 28

Accession

1. The Protocol shall be open for accession by any States and by any regional economic integration organization Party to the Basel Convention which has not signed the Protocol. The instruments of accession shall be deposited with the Depositary.

2. In their instruments of accession, the organizations referred to in paragraph 1 of this Article shall declare the extent of their competence with respect to the matters governed by the Protocol. These organizations shall also inform the Depositary of any substantial modification in the extent of their competence.

3. The provisions of Article 27, paragraph 2, shall apply to regional economic integration organizations which accede to the Protocol.

Article 29

Entry into force

1. The Protocol shall enter into force on the ninetieth day after the date of deposit of the twentieth instrument of ratification, acceptance, formal confirmation, approval or accession.

2. For each State or regional economic integration organization which ratifies, accepts, approves or formally confirms the Protocol or accedes thereto after the date of the deposit of the twentieth instrument of

ratification, acceptance, approval, formal confirmation or accession, it shall enter into force on the ninetieth day after the date of deposit by such State or regional economic integration organization of its instrument of ratification, acceptance, approval, formal confirmation or accession.

3. For the purpose of paragraphs 1 and 2 of this Article, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by member States of such organization.

Article 30

Reservations and declarations

1. No reservation or exception may be made to the Protocol. For the purposes of the Protocol, notifications according to Article 3, paragraph 1, Article 3, paragraph 6, or Article 14, paragraph 5, shall not be regarded as reservations or exceptions.

2. Paragraph 1 of this Article does not preclude a State or a regional economic integration organization, when signing, ratifying, accepting, approving, formally confirming or acceding to the Protocol, from making declarations or statements, however phrased or named, with a view, inter alia, to the harmonization of its laws and regulations with the provisions of the Protocol, provided that such declarations or statements do not purport to exclude or to modify the legal effects of the provisions of the Protocol in their application to that State or that organization.

Article 31

Withdrawal

1. At any time after three years from the date on which the Protocol has entered into force for a Contracting Party, that Contracting Party may withdraw from the Protocol by giving written notification to the Depositary.

2. Withdrawal shall be effective one year from receipt of notification by the Depositary, or on such later date as may be specified in the notification.

Article 32

Depositary

The Secretary-General of the United Nations shall be the Depositary of the Protocol.

Article 33

Authentic texts

The original Arabic, Chinese, English, French, Russian and Spanish texts of the Protocol are equally authentic.

Annex A

LIST OF STATES OF TRANSIT AS REFERRED TO IN ARTICLE 3, SUBPARAGRAPH 3 (D)

1. Antigua and Barbuda
2. Bahamas
3. Bahrain
4. Barbados
5. Cape Verde
6. Comoros
7. Cook Islands
8. Cuba
9. Cyprus
10. Dominica
11. Dominican Republic
12. Fiji
13. Grenada
14. Haiti
15. Jamaica
16. Kiribati
17. Maldives
18. Malta
19. Marshall Islands
20. Mauritius
21. Micronesia (Federated States of)
22 Nauru and the Netherlands Antilles
23. Netherlands, on behalf of Aruba
24. New Zealand, on behalf of Tokelau
25. Niue
26. Palau
27. Papua New Guinea
28. Samoa
29. Sao Tome and Principe
30. Seychelles
31. Singapore
32. Solomon Islands
33. St. Lucia
34. St. Kitts and Nevis
35. St. Vincent and the Grenadines
36. Tonga
37. Trinidad and Tobago
38. Tuvalu
39. Vanuatu

Annex B

FINANCIAL LIMITS

1. Financial limits for the liability under Article 4 of the Protocol shall be determined by domestic law.

2. The limits of liability shall:

   (a) For the notifier, exporter or importer, for any one incident, be not less than:

   (i) 1 million units of account for shipments up to and including 5 tonnes;

(ii) 2 million units of account for shipments exceeding 5 tonnes, up to and including 25 tonnes;

(iii) 4 million units of account for shipments exceeding 25 tonnes, up to and including 50 tonnes;

(iv) 6 million units of account for shipments exceeding 50 tonnes, up to and including to 1,000 tonnes;

(v) 10 million units of account for shipments exceeding 1,000 tonnes, up to and including 10,000 tonnes;

(vi) Plus an additional 1,000 units of account for each additional tonne up to a maximum of 30 million units of account;

(b) For the disposer, for any one incident, be not less than 2 million units of account for any one incident.

3. The amounts referred to in paragraph 2 shall be reviewed by the Contracting Parties on a regular basis taking into account, inter alia, the potential risks posed to the environment by the movement of hazardous wastes and other wastes and their disposal, recycling, and the nature, quantity and hazardous properties of the wastes.

Annex IV

REVIEW OR ADJUSTMENT OF LISTS OF WASTES CONTAINED IN ANNEXES VIII AND IX OF THE BASEL CONVENTION

1. **Applications**

- Applications must be submitted using the form and application procedure approved by the fourth meeting of the Conference of the Parties. Any application submitted to the secretariat shall be by or through a Party or observer State.

- Additional information should be submitted to the next meeting of the Technical Working Group in line with the time frame for new applications, i.e., 90 days before the meeting.

2. **Technical Working Group action**

- The Technical Working Group will consider and review the applications for placement or removal of wastes on Annexes VIII or IX. The applications must be based on sound scientific assessment in accordance with Article 1, paragraph 1 (a), of the Basel Convention.

- The Technical Working Group should arrive at a decision by consensus.

- The decisions of the Technical Working Group on the placement or removal of wastes on lists contained in Annexes VIII or IX shall be transmitted in a report of the Technical Working Group through the secretariat to the next meeting of the Conference of the Parties. The Chairperson of the Technical Working Group can transmit the report through the secretariat to the President of the Conference of the Parties and seek agreement on the way forward in having a formal submission to the Conference of the Parties in accordance with Articles 17 and 18 of the Convention.

3. **Effective review procedure**

• Costs of review should be kept to a minimum. This could be achieved by means of holding 3 meetings biannually (two in years where there is no Conference of the Parties and one in the year of the Conference of the Parties). Summary of cases restricted to 8 additional pages would help save costs, though a Party wishing to provide more information could do so at its own cost.

4. **Reporting**

• The secretariat of the Basel Convention should provide a report to Parties on the status of lists of wastes in Annexes VIII and IX of the Basel Convention on an annual basis, and when changes entered into force.

APPLICATION FORM FOR THE PLACEMENT OR REMOVAL
OF WASTES ON ANNEX VIII OR ANNEX IX

A. WASTE IDENTIFICATION

1. **Proposed wording for the placement (or replacement wording for existing category)**

2. Name of the waste: _____
3. Origin of the waste: _____
4. Physical form: _____
5. Major constituents: _____
6. Typical contaminants: _____

7. Waste Code: UN Class _____ UN number _____
IWIC _____ OECD _____
EWC ____ Others (e.g. Harmonized System Code, BIR, ISRI, IPMI, etc.)

8. Enter all relevant Y numbers

9. Hazard characteristics

☐	H1	☐	H4.3	☐	H6.2	☐	H12
☐	H3	☐	H5.1	☐	H8	☐	H13
☐	H4.1	☐	H5.2	☐	H10	☐	H4.2
☐	H6.1	☐	H11				

B. PROPOSED PLACEMENT **PROPOSED REMOVAL**

List A of Annex VIII	☐	From list A of Annex VIII	☐
List B of Annex IX	☐	From list B of Annex IX	☐

C. NATIONAL DEFINITION

Is the waste legally defined as or considered to be hazardous in the country submitting the application?

Yes ☐ No ☐

D. COMMERCIAL CLASSIFICATION

Is the waste routinely traded through established channels and is that evidenced by commercial classifications?

Yes ☐ No ☐

SUMMARY OF REASONS FOR PROPOSED PLACEMENT

NB: A detailed case (no more than 8 additional pages) should be attached considering the category(ies) in Annex I to the Basel Convention under which the waste falls with evidence demonstrating that the waste does or does not exhibit any of the hazard characteristics in Annex III to the Convention (see guidance - to be drafted). Additional material may be submitted in the form of annexes or attachments. All such annexes or attachments must be listed in the application form, together with instructions on how to obtain these documents.

E. NAME OF APPLICANT

Name: _____
Address: _____
_____
Tel: _____
Fax: _____
E-mail: _____

Party ☐
Observer State ☐
NGO ☐
Company ☐
Individual ☐

_____ _____
(Signature) (Stamp)

F. AUTHORITY TRANSMITTING APPLICATION

Name: _____
Address: _____
_____
Tel: _____
Fax: _____
E-mail: _____

_____
(Signature)

_____
(Stamp)

Date of transmission: _____

This application form may include up to 8 additional pages.

APPLICATION FORM PROCEDURE

Who is to complete the form (applicant)?

• Any Contracting Party, observer State, non-governmental organization, private company or individual has the right to fill in the application form with the proposed placement of wastes under Annex VIII or Annex IX, or with a proposal for removing wastes from Annex VIII, Annex IX or working list C.

Procedure for transmission of the form

• The applicant must present the application form with any supporting annexes and attachments to national authorities for the Basel Convention.

• The competent authority and/or focal point should consider the application form with any supporting annexes and attachments and only forward it to the secretariat of the Basel Convention if it is properly completed and if it considers the completed application provides sufficient information for the Technical Working Group to reach a decision.

☐ It is for the national authority to decide how the application form will be forwarded to the secretariat of the Basel Convention. Normally, the competent authority or focal point of the Basel Convention will be responsible for transmitting the form to the secretariat. For those Parties that have more than one competent authority, they will need to decide through which competent authority the form should be forwarded to the secretariat.

• The Technical Working Group will consider the application at its next meeting, provided it is received by the secretariat within the time-frame outlined below.

Time-frame for application

• The application form for placement or removal of wastes has to be submitted to the secretariat of the Basel Convention at least three months prior to the meeting of the Technical Working Group. The secretariat will despatch completed applications within two months of the date of the next Technical Working Group meeting.

• Competent authorities and focal points are requested to make available any annexes or attachments to all focal points of the Basel Convention and to advise the secretariat that this has been done. If a competent authority or focal point is unable to make available any annexes or attachments to all focal points of the Basel Convention, it may request the secretariat to undertake this function.

• In exceptional circumstances, a Party may communicate a proposal(s) for placement or removal of wastes six weeks before the meeting of the Technical Working Group if such proposal(s) cannot be sent to the secretariat within the three month deadline. The Party, in this case, would need to send the proposal(s) to all other focal points, as well as to the secretariat. The Technical Working Group would endeavour to consider such application(s) at its next meeting.

Annex V

MESSAGE OF MR. KOFI ANNAN, SECRETARY-GENERAL OF THE UNITED NATIONS, TO THE FIFTH MEETING OF THE PARTIES TO THE BASEL CONVENTION

1. Hazardous and toxic wastes, emanating from chemical and pesticide manufactures, petrochemical refineries, makers of synthetics and plastics, industries, mines, farms, nuclear power and weapons plants and

military activities, continue to pose significant threats to ecosystems and human health. An estimated 3 million tonnes of toxic and hazardous waste cross national borders each year.

2. The Basel Convention, in its first ten years, has succeeded in putting hazardous wastes and the implications of their indiscriminate disposal on the global agenda. The second decade must be one of implementation. That means that the parties to the Convention will need to strengthen old alliances and create new ones. You will need to think beyond traditional domains, and reach out to non-governmental organizations, industries and others who possess the knowledge, technology and financial resources needed for building and improving capacity to manage wastes, especially in the developing world.

3. Developing countries have already benefited significantly from your work. You have prevented them from becoming dumping grounds for the industrialized world. The challenge now is to empower them so that they can follow the path of sustainable development.

4. We must also, in the years ahead, begun to think of the environment and hazardous waste with a new logic. We need to encourage the view that clean water and land are valuable not only for their beauty, but also as economic goods. And we must do more to drive home the message that it makes good economic sense to reduce the generation of hazardous waste in the first place. Corporations already profit from such reductions, so does the planet. As in so many realms, prevention pays.

As you move ahead in these directions, let me assure you that you can rely on the full support of the United Nations system. We share one world and only one: we can ill afford to waste it.

Annex VI

STATEMENT BY IMO ON THE DISMANTLING OF SHIPS

1. The Commission on Sustainable Development at its seventh session earlier in 1999 requested IMO, in cooperation with other organizations, to consider safety and environmental aspects associated with ship scrapping activities.

2. The Marine Environment Protection Committee (MEPC) of IMO held its forty-third session in July and the item on ship scrapping/demolition/recycling was discussed on the basis of a proposal made by Norway (contained in document MEPC/43/18/1) and comments submitted by the member States and the observer organizations.

3. A representative of the Basel Convention secretariat attended the meeting and informed MEPC of the ship dismantling activities within the conference of the Parties to the Basel Convention.

4. The initial proposal by Norway was to include this item in the work programme of MEPC and to develop a resolution of the IMO Assembly on the need for an international regime on the ship scrapping and of the need for an inter-agency cooperation in developing such a regime. There was a detailed and comprehensive discussion at MEPC. It was noted that the shipping industry was facing a substantial volume of ageing vessels originating from the building boom of the 1970s and now approaching the age of decommissioning. It is estimated that around 700 sea-going ships are scrapped each year.

5. A large crude carrier can contain several tonnes of asbestos, PCB, heavy metals, hydrocarbons, ozone-depleting substances and others. Environmental, human health and safety risks have been clearly demonstrated. It has become evident, however, that a number of technical, legal and administrative problems will have to be addressed to mitigate the negative effects of the ship demolition practices. For example, today the ship follows

paths from an operative to a decommissioned State. However, no internationally agreed procedure which involves the flag State, the State of reception and international organizations exists.

6. Ships have to meet certain requirements to sail. Similarly, it was suggested that requirements relating to the environmental condition of a ship designated for scrapping could be defined.

7. It was felt that there were loopholes in the existing Basel Convention and IMO instruments, as they were not specifically designed for the case. In this respect, the need for inter-agency cooperation and the need for a holistic approach was fully recognized.

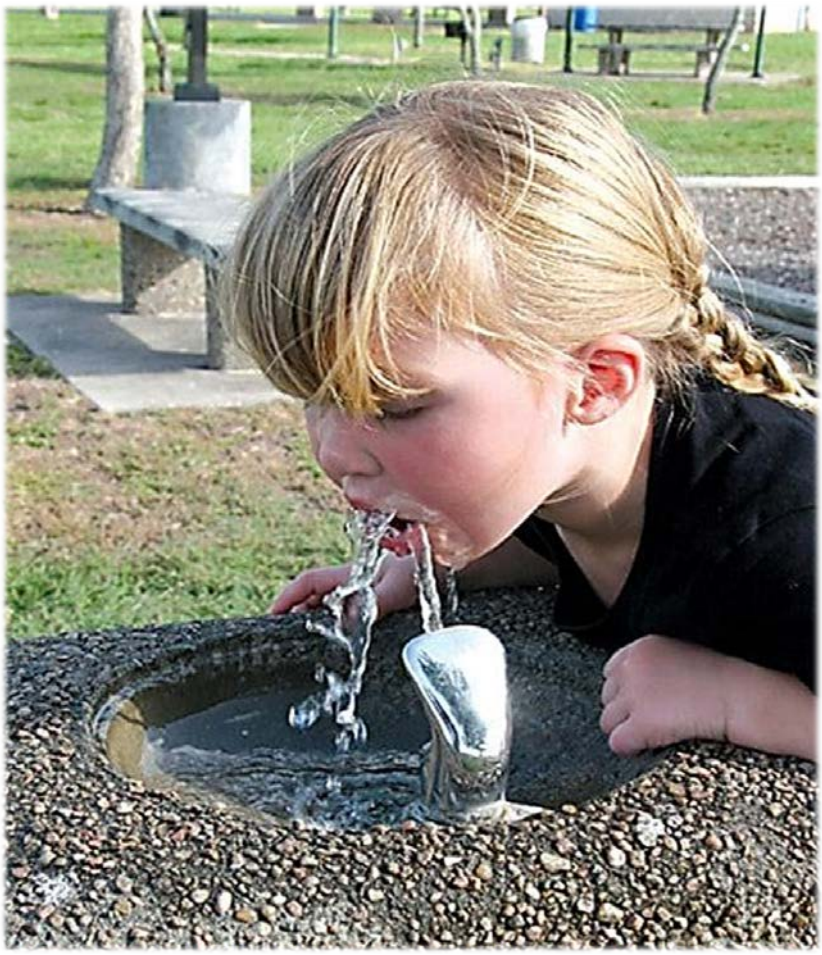
8. MEPC agreed to include this item in both its work programmes and will further discuss it at its next session in March 2000, when it is expected to agree on the working schedule and arrangements. Meanwhile, the secretariat was requested to liaise with other organizations, in order to coordinate their respective activities.

Att #2:

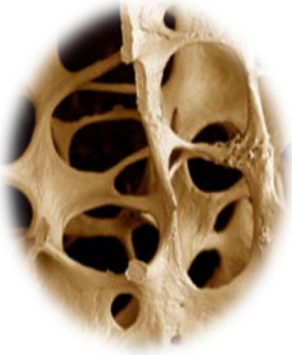
THE HIDDEN DANGER

BY
DR. RAYMOND RAY, D.Sc.
(raykraan@gmail.com)

THE TRUTH ABOUT FLUORIDE



HEALTHY HUMAN BRAIN. **ALZHEIMER BRAIN**



HEALTHY BONE **OSTEOPOROSIS BONE**

HEALTHY TEETH

MILD FLUOROSIS

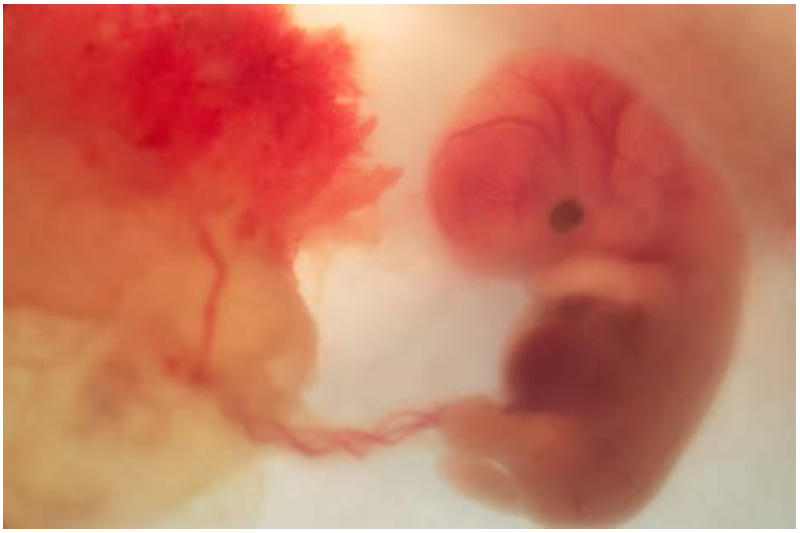
MODERATE /SEVERE

MODERATE /SEVERE

SEVERE

SEVERE

ABOVE DENTAL FLUOROSIS DUE TO EXCESS FLUORIDE CONSUMPTION FROM DRINKING WATER.

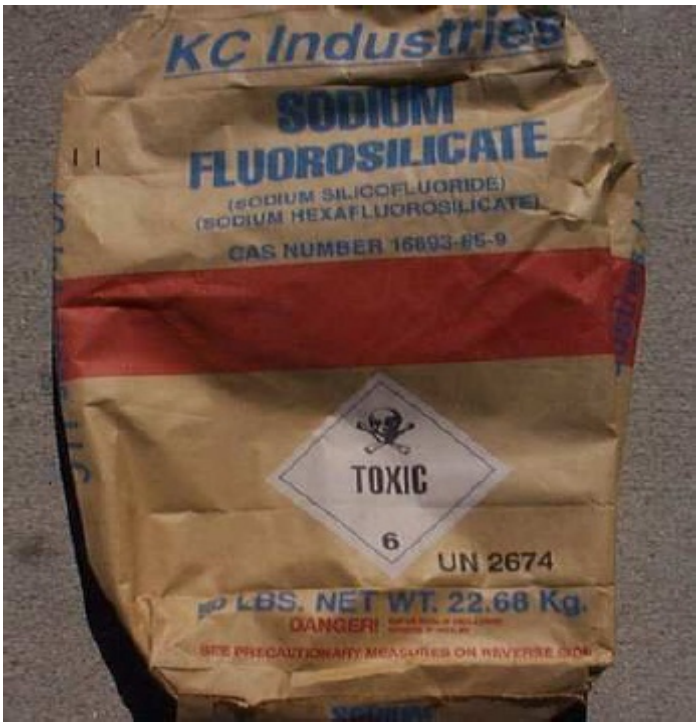


LIFE IS JUST BEGINNING BUT ALREADY MEDICATED TO PREVENT TOOTH DECAY

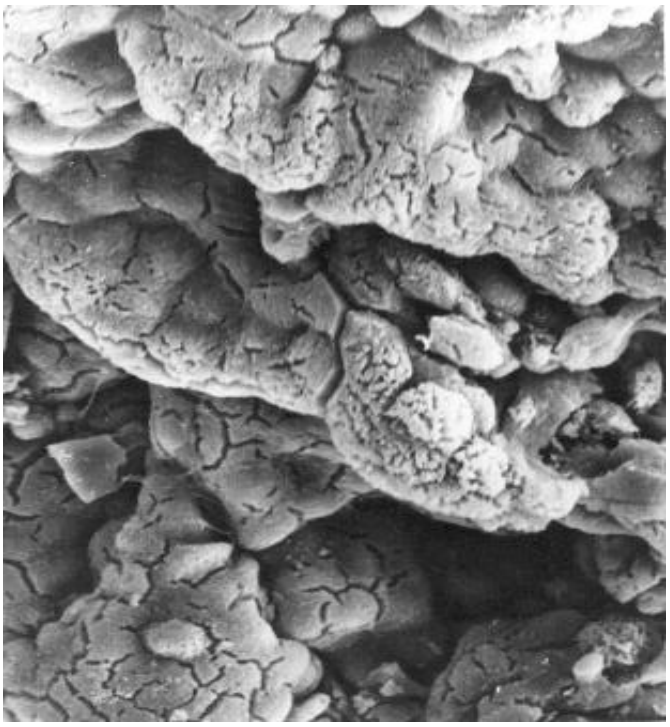
WARNING ON FLUORIDATED TOOTH PASTE.

"WARNINGS: Keep out of reach of children under 6 years of age. If more then use of brushing is accidentally swallowed get medical help or contact a poison control center right away.

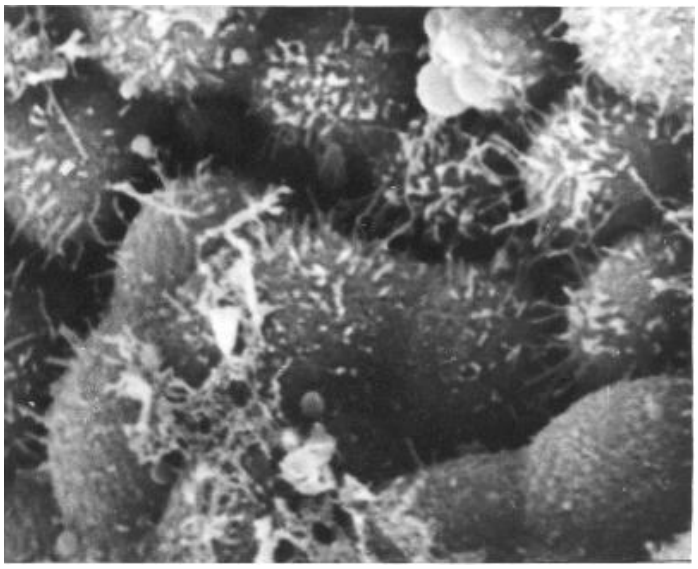
If the words "medical help" and "poison control center" don't grab your attention, they should. Since mid-1997, the U.S. Food and Drug Administration (FDA) have mandated all toothpastes containing FLUORIDE to carry this warning. And for good reason.



THIS PACKAGING AND TOXIC SIGN WILL TELL WHAT IS IN OUR DRINKING WATER.



SCANNING ELECTRON MICROGRAPH OF GASTRO-INTESTINAL MUCOSA OF AN INDIVIDUAL SUFFERING FROM NON-ULCER DYSPEPTIC COMPLAINTS; CONSUMING WATER WITH 3.2 PPM (MG/L) OF FLUORIDE



SCANNING ELECTRON MICROGRAPH OF GASTRO-INTESTINAL MUCOSA OF AN INDIVIDUAL SUFFERING FROM "NON-ULCER DYSPEPTIC" COMPLAINTS; CONSUMING WATER CONTAMINATED WITH 1.2 PPM (MG/L) OF FLUORIDE.

ABOVE TORONTO HUMBER WASTE WATER TREATMENT PLANT. WATER CONTAIN UNREMOVABLE FLUORIDE ENDING IN OUR WATER SOURCE LAKE ONTARIO

1. ABBREVIATIONS:

ADA	American Dental Association
ADD	Attention Deficit Disorder

AEC	U.S. Atomic Energy Commission
ASD	Autistic Spectrum Disorder
CRHA	Calgary Regional Health Authority
DDT	Dichloro-diphenyl-trichloroethane
DNA	Deoxyribonucleic acid
D. Sc.	Doctorate in Science
EPA	Environmental Protection Agency
EU	European Union
FDA	Food and Drug Administration.
ICP	Intracranial Pressure
IQ	Intelligent Quotient
NaF	Sodium Fluoride
NRC	National Research Council
NTP	National Toxicology Program
ODW	Office of Drinking Water
PG	Propylene Glycol
PPM	Part Per Million
RSI	Repetitive Stress Injury
U.S. or USA	United States of America
WHO	World Health Organization

2. DECLARATION:

I hereby declare that I have no financial gain or any kind of hidden gain in writing and distributing this article. I hope to see the end of adding fluoride to our drinking water. No matter what we are told it is only causing more harm than good. I have dedicated many hours of my time in writing this document hoping that our city councils, Governmental Authority will listen to us and stop using our bodies and our children's body as a dumping ground for toxic and deadly chemicals in the name of tooth decay prevention.

The organizations, scientists and researchers who wrote and provided the information at no cost are society's trustable and respected people and I thanks them for their kind efforts to help to protect us from the wrong and evil greed of heartless individuals.

I have done my best to acquire the information around the globe, which I believe to be true and correct. Any mistakes are not made intentionally. Therefore I assume no responsibility for the accuracy or reliability of the statutory and regulatory information provided by this article. This article has been prepared for convenience of reference only. For all purposes of interpreting and applying the law it is requested to consult the official publications of Canada's laws, which are available in most public libraries.

This document is provided to you free of cost and I hope that you will read and distribute it via email or by any other means to everyone you know no matter who he or she is.

My hope and desire is that each of you will join me in the fight to end fluoridated water. If there is any crime committed by those people we trust and pay to protect us, they must be brought to justice for using our bodies and our children's bodies as dumping grounds of toxic waste for their personal gain.

I want you all, those standing against fluoridation, to accept my genuine and heartfelt thanks for standing

beside me to fight against fluoridated water.

3. INTRODUCTION:

The war criminal Adolf Hitler once told that “Tell a lie loud enough and long enough and people will believe it.". Is it not true?

According to Robert Carlton, Ph.D., former EPA scientist, 1992 "Fluoridation is the greatest case of scientific fraud of this century." The history of forcing fluoride on humans through the fluoridation of drinking water is wrought with greed and deception. Governments that add fluoride to drinking water supplies insist that it is safe, beneficial and necessary, however, scientific evidence and many researches shows that fluoride is not safe to ingest and areas that fluoridate their drinking water supplies have same rates of cavities as those don’t. Because of the push from the aluminum, steel, pharmaceutical, fertilizer industry and weapons manufacturers’. Fluoride continues to be added to water supplies all over North America. There is a growing resistance against adding toxic fluoride to our water supplies, but unfortunately, because fluoride has become "the lifeblood of the modern industrial economy"(Bryson 2004), there is too much money at stake for those who endorse water fluoridation. The benefits of water fluoridation will continue to be fed to the public even those seniors populations has no tooth at all not for health benefits for the population but to profit the industrial complex.

American ‘education and research’ as well as many Canadian Industries and Associations was funded by the fluoride producing Industry looking for an outlet for the increasingly mounting fluoride industrial waste while attaining positive profit increase. The ‘discovery’ that fluoride benefited teeth, was paid for by industry that needed to be able to defend "lawsuits from workers and communities poisoned by industrial fluoride emissions" (Bryson 1995) and turn a liability into an asset. Fluoride is so much a part of a multibillion-dollar industrial and pharmaceutical income, that any withdrawal of support from pro-fluoridationists is financially impossible, legally unthinkable and potentially devastating for their career and reputation.

In a society where products containing asbestos, lead, beryllium and many other carcinogens have been recalled from the marketplace, it is surprising that fluoride is embraced so thoroughly and blindly. It seems absurd that we would consider paying the chemical industry to dispose of their toxic waste by adding it to our water supply.

For years there have been snippets of information coming out about the dangers of fluoride in our water supply. Our health organizations dismiss these claims each and every time and insist, “Everything is perfectly safe.” The latest information however refutes all this and is of vital importance to everyone – particularly every mother of a growing child, because it has now been proven by years and years of research that fluoride is highly dangerous and the missing link in birth defects and mental retardation in young children, as well as the epidemic of Alzheimer’s.

Professor A.K. Susheela, PhD., who has researched fluoride for more than 20 years and is one of the world’s leading researchers and experts on fluoridated water, says long-term studies show fluoride is a serious threat to public health. Dr. Susheela says the studies have shown that fluoride destroys:

- Muscle structure and muscle function
- Muscle energy
- Bone and teeth

- Red blood cells and blood vessels
- Stomach and intestine linings

Hexafluorosilicic acid (H2SiF6) and sodium silicofluoride (Na2SiF6) are the two compounds (fluoride) products most commonly used in water fluoridation. Even though those two items are classified as most hazardous waste at various international treaties signed by Canada (e.g., Basel, Switzerland Convention). Please See page #53 ANNEX I, CATEGORIES OF WASTES TO BE CONTROLLED. Fluoride is in the list.
http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf

The addition of fluorosilicates into drinking water is clearly a method of ***recycling*** or ***disposing*** this ***hazardous*** waste, according to Deputy Assistant Administrator for Water at the United States Environmental Protection Agency.

Health Canada has misrepresented the U.S. NRC 2006 Review, the York 2000 review, and WHO by claiming the safety of fluoride used in our drinking water. Unfortunately it is not supported by any laboratory research. It has violated our fundamental rights and freedoms.

As per the World Health Organization (WHO at Geneva, 2002), the Environmental Health Criteria 22, under the joint sponsorship of the United Nations Environment Program, the International Labor Organization and Program for the Sound Management of Chemicals, very clearly stated that there is evidence suggesting fluoride intake through drinking water and food causes serious damage to bone structure and strength known as skeletal fluorosis. It damages the teeth also known as dental fluorosis and attacks vital organs, glands and brain. But on Apr.4.2011 statement made by Dr. Arlene King, Chief Medical Officer of Health, Health and Long-term care that "*studies have not linked fluoride to cancer, bone fractures or intelligence levels. Studies have also found that water fluoridation is safe for the environment, and poses no risk to plants and animals."*
(http://www.health.gov.on.ca/en/news/bulletin/2011/hb_20110404_2.aspx).

A 95 page report (ISSN 1497-2689 ISBN 0-662-29603-6 # ENL-34/3-2001E) prepared and published by National Guidelines and Standards Office, Environmental Quality Branch Environmental Canada in regards to the Canadian Water Quality Guidelines for the protection of Aquatic life is approved by Canadian council of Ministers of the Environment.

These reports states that inorganic fluoride is toxic and acts as enzyme inhibitors and has wide ranging effects: It causes changes in blood composition; reduces size and growth; slows embryonic and development life stage; impairs reproduction and abnormal behavior. Inorganic fluorides are also neurotoxic, causing adverse effects on the central nervous system.

Water fluoridation is therefore an indirect means of disposing toxic substances and hazardous wastes into the environment. Sewage treatment practices currently are unable to remove fluoride from either primary or secondary treatment, therefore fluoride levels in sewage to our water source, such as lake or river, from any city or town that fluoridates exceeds the Canadian Water Quality Guideline for Aquatic Species.

For some undisclosed reasons our Chief Medical Officer of Health, Health and Long-term care Dr. Arlene King, telling us exactly opposite.

Consider that when so called fluoride is injected into our drinking water, we only drink less than one percent of the total water supply and the remaining 99% is used for washing cars, watering the lawn, washing dishes, flushing toilets, filling the swimming pool, taking baths and showers and so on. This way, the hazardous chemical literally goes down the drain and ends up in our water source..

Here is two Governmental agency telling us two different things. Whom to believe and trust. Of course if Dr. King do not have her doctorate in biochemistry then we are not getting what our money worth..

Christopher Bryson, the author of The Fluoride Deception, who has recently called the widespread promotion of fluoride "scientific fraud on a grand and global scale."

Please see the video of Dr. Paul Connett, Ph.D. Professor of Chemistry at St. Lawrence University in New York http://www.youtube.com/watch?v=zo6SnvmMP9k

4. WHAT IS FLUORIDE:

Fluorine is the chemical element with atomic number 9, represented by the symbol **F**. It is the lightest element of the halogen column of the periodic table and has a single stable isotope, fluorine-19.
At standard pressure and temperature, fluorine is a highly toxic pale yellow gas composed of diatomic molecules, F_2.

Fluorine is the most electronegative element and forms stable compounds call fluorides, with all elements except helium and neon. The largest uses of inorganic fluorides are steel making and aluminum refining.

It is about 1.3 times heavier then air at atmospheric pressure and temperature. . Fluorine gas is the most powerful oxidizing agent known, reacting with practically all substances that are organic and inorganic. Uses of this gas in different industries create certain toxic byproducts such as Sodium Fluoride, Hexafluorosilicic acid and sodium silicofluoride are few of many created by capturing the fluorine atoms.

Sodium fluoride is a basic ingredient in Sarin Nerve Gas (Isopropyl-Methyl-Phosphorylate fluoride). The Sarin Nerve Gas that was used by German at World War II to kill millions of Jewish prisoners. It was also used by Iraq in Iran and on Kurdish people. It happened also in Japan in a crowded subway train where terrorists released the deadly gas. We can call Sarin gas also Fluoride.

Even in very small quantities, sodium fluoride is a deadly poison to which no effective antidote has been found. Sodium fluoride also used as the primary ingredient in many rat and cockroach poisons. Sodium Fluoride is entirely different from Calcium-fluoro-phosphate needed by our bodies and provided by nature.

Tara Blank, Ph.D., the Science and Health Officer for the Fluoride Action Network said that millions of children are being exposed unnecessarily to this neurotoxin on a daily basis. Who in their right mind would risk damaging their child's brain, deforming their bone structure, and possibly threaten their life, in order to reduce a small amount of tooth decay, for which the evidence is very, very weak.

According to Environment Canada (1993), the total estimated annual release of inorganic fluorides from anthropogenic sources to the Canadian environment (air, land, and water) is in excess of 12,400 tones. Atmospheric emissions account for at least 5 200 tones (42%) while over 5 500 tones (44.7%) discharged

to waters and to land are estimated to exceed 1600 tones (13.3%).

5. BEGINNING OF WATER FLUORIDATION:

The very first occurrence of purposefully putting sodium fluoride into drinking water was in the German ghettos and in Nazi Germany's prison camps. The Gestapo had no concern about sodium fluoride's effect on children's teeth, instead, their reason for mass-medicating water with sodium fluoride was to sterilize men and women and force the people in their concentration camps into calm, bovine, submission. ("The Crime and Punishment of I.G. Farben" written by Joseph Borkin.) How is it so that Canadian health organizations would persuade a civilized nation to voluntarily add a deadly poison to its drinking water systems?

According to Joel Griffiths and Chris Bryson, some fifty years after the United States began adding fluoride to public water supplies to reduce cavities in children's teeth, declassified government documents are shedding new light on the roots of that still-controversial public health measure, revealing a surprising connection between fluoride and the dawning of the nuclear age.

Since the days of World War II, when U.S.A prevailed by building the world's first atomic bomb, U.S. public health leaders have maintained that low doses of fluoride are safe for people and good for children's teeth.

That safety verdict should now be re-examined in the light of hundreds of once-secret WWII documents obtained by Griffiths and Bryson – including declassified papers of the Manhattan Project, the U.S. military group that built the atomic bomb.

Fluoride was the key chemical in atomic bomb production, according to the documents. Massive quantities of fluoride were essential for the manufacture of bomb-grade uranium and plutonium for nuclear weapons throughout the Cold War. One of the most toxic chemicals known, fluoride rapidly emerged as the leading chemical health hazard of the U.S atomic bomb program - both for workers and for nearby communities, the documents reveal.

A-bomb program scientists, who had been secretly ordered to provide "evidence useful in litigation" against fluoride injury to citizens, generated much of the original proof that fluoride is safe for humans in low doses. The first lawsuits against the U.S. A-bomb program were not over radiation, but over fluoride damage, the documents show.

Human studies were required. Bomb program researchers played a leading role in the design and implementation of the most extensive U.S. study of the health effects of fluoridating public drinking water - conducted in Newburgh, New York from 1945 to 1956. Then, in a classified operation code-named ***Program F,*** they secretly gathered and analyzed blood and tissue samples from Newburgh citizens, with the cooperation of State Health Department personnel.

The original secret version, obtained by reporters, of a 1948 study published by **Program F** scientists in the Journal of the American Dental Association shows that evidence of adverse health effects from fluoride was censored by the U.S. Atomic Energy Commission (AEC) – considered the most powerful of Cold War agencies – for reasons of national security.

The bomb program's fluoride safety studies were conducted at the University of Rochester, site of one of

the most notorious and disgusting human radiation experiments of the Cold War, in which unsuspecting hospital patients were injected with toxic doses of radioactive plutonium. The fluoride studies were conducted with the same ethical mind-set, in which *national security* was paramount.

The U.S. government's conflict of interest - and its motive to prove fluoride is *safe* – has not until now been made clear to the general public in the furious debate over water fluoridation since the 1950's, nor to civilian researchers and health professionals, or journalists.

The declassified documents resonate with growing body of scientific evidence, and a chorus of questions, about the health effects of fluoride in the environment.

Human exposure to fluoride has mushroomed since World War II, due not only to fluoridated water and toothpaste, but to environmental pollution by major industries.

The impact can be seen, literally, in the smiles of our children. Large numbers of young people - up to 80 percent in some cities - now have dental fluorosis, the first visible sign of excessive fluoride exposure, according to the U.S. National Research Council.

So the question remains, why is it in our water supply? Why are we told it is safe and good for our health? Why are millions of dollars paid to buy the toxic waste from the producers who would have had a great expense to dispose of it and also avoid enormous tort liability that could be incurred if toxicity were officially recognized? Who is benefiting from it? What is the secret that we should not know?

6. WATER IS LIFE:

Without water no life can exist. Water, making up about 66 percent or more of the human body, runs through the blood, inhabits the cells, and lurks in the spaces between. At every moment water escapes the body through sweat, urination, defecation or exhaled breath, among other routes. Replacing these lost stores is essential. When we drink the water that is fluoridated, our bodies absorb the chemicals not just in our teeth but also in other calcifying tissues.

7. UN RESOLUTION – THE HUMAN RIGHT TO WATER:

On July 28, 2010, the United Nations General Assembly GA/10967 overwhelmingly agreed to a resolution A/RES/64/292, declaring the human right to *safe and clean drinking water and sanitation.* (*http://www.un.org/News/Press/docs/2010/ga10967.doc.htm)* One hundred and twenty-two countries voted in its favor. Canada was one of the 41 abstentions. The recognition of water as a human right in international law would allow the United Nations to monitor the progress of states in realizing the right to water. It also stated the water required for each personal and domestic use must be safe, therefore free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health. Ask yourself what was the reason Canada fail to be there?

8. ONTARIO WATER ACT:

The safe drinking water act 2002, S.O. 2002, c. 32, Water resources act R.S.O. 1990, c. O.40,

Environmental protection Act R.S.O. 1990, Chapter E.19. Environmental bill of Right act S.O. 1993, Chapter 28 do not support addition or discharging toxic chemical into the water. Clean Water Act (S.O. 2006, Chapter 22) is a law enacted by the Legislative Assembly of Ontario and will require local communities to look at the existing and potential threats to their water and set out to implement the following:

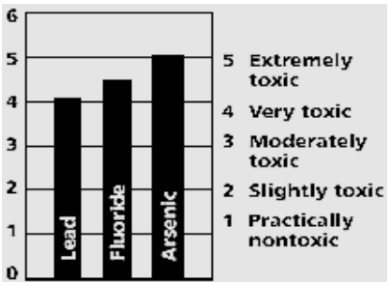
- Actions necessary to reduce or eliminate significant threats.
- Empower communities to take action to prevent threats from becoming significant.
- Require public participation on every local source protection plan. This means everyone in the community gets a chance to contribute to the planning process.
- Require that all plans and actions be based on sound science.

.

9. THE TOXIC FLUORIDE PRODUCERS:

Hydrofluosilicic acid (H2SiF6) is a waste by-product derived from the industrial manufacture of aluminum, zinc, uranium (for nuclear weapons and power industries) aerosols, insecticides, fertilizers, plastics, lubricants and pharmaceuticals. Fluoride has been recorded as a as ***Part II Poison*** under the UK Poisons Act 1972 ranking in toxicity above lead and just below arsenic.

Below a chart showing the Toxicity of Fluoride compare with Lead and Arsenic, based on LD50 data from Robert E. Gosselien et al. Clinical Toxicology of commercial division.



Please note that the Maximum Allowable Contaminant level (MAC) of fluoride has been set by Health Canada regulations to be 2 orders of magnitude higher than other comparable toxic contaminants such as arsenic and lead. Such regulation affords a tolerance for this contaminant, which appears unjustified. The government policies regarding this product suggest a lack of awareness as to this product's true toxicity.

10. CITY OF HAMILTON

Public Health Services misguiding its citizen by telling that Fluoride is a naturally occurring material found in water, plants, rocks, soil, air and most foods. It is true that Calcium fluoride comes from the earth and is naturally occurring. Our body need calcium fluoride. But the Fluoride added to our drinking water is completely different chemical. It is extremely hazardous by-product of the of some industrys.

For example, H2O is water. A molecule of water contains 2 hydrogen atom and one oxygen. We drink it every day. But when you take one hydrogen atom from this water and combine with one chlorine atom it becomes HCL. A deadly hydrochloric acid.

We know that Hamilton is polluted with fluoride from its steel plant. So why we need to add more.

According to study made by Dr. V.A. Cecilioni Hamilton, Ontario, Canada he said that "Lung Cancer in a Steel City - Its Possible Relation to Fluoride Emissions". This was followed two years later by "Further Observations on Cancer in a Steel City". Both studies presented evidence of a connection between industrial air pollution in Hamilton and the high mortality rates for cancer of the lung, as well as cancer of the gastro-intestinal tract and genito-urinary system. The highest mortality rate for lung cancer was in the northeast area of the city, close to the large steel mills. The victims were mostly men who had worked therein or had resided nearby for many years.

The major source of the excessive amounts of fluorides in the Hamilton atmosphere is the huge amounts of fluorspar (Spar) used in steelmaking. Tons of fluoride are used daily by the two huge and one medium-sized steel mills in Hamilton; all three mills are located in the northeast section of the city. An analysis of dust from one Hamilton steel mill gave the following result (a "control" dust sample is shown in brackets):

Arsenic 4.3 ppm [1.81]
Cadmium 1.6 ppm [0.21]
Fluoride 3.46% [0.063]
Lead 160 ppm [13]
Mercury 0.26 ppm [0.08]
Zinc 1100 ppm [70]

The most striking aspect of the dust composition is its high fluoride content of 3.46% or 34,600 ppm, 55 times higher than in "control" dust.

Dr. Ceciloni found in his 1972-74 studies, the male death rate from lung cancer in the most heavily polluted residential zone was 65/100,000, which was 2.83 times higher than the national average of 23/100,000. .

Finally, the fact that fluoride has recently been implicated as a likely carcinogen responsible for osteosarcomas.

11. OUR BIG BROTHERS DO NOT LIKE IF YOU OPEN YOUR MOUTH:

The toxic fluoride producers will use their financial power to stop anyone who goes against their interest. To them the dollar is first and human life is second.

Dr. William Marcus, a Senior Science Advisor and toxicologist in the Office of Drinking Water (ODW) of the US Environmental Protection Agency, who had strongly criticized the emasculation of the NTP study results, was fired for alleged misconduct unrelated to fluoride. In the subsequent court case against the EPA by Dr. Marcus it was proven that the EPA had used false evidence in order to try to incriminate Dr. Marcus. Judge David A. Clarke Jr. declared in his decision on this case on December 3rd 1992 that "*the reasons given for Dr. Marcus' firing was a pretext ... his employment were terminated because he publicly questioned and opposed EPA's fluoride policy*". Marcus was ordered to be reinstated, with back pay, fringe benefits and interest, attorney's fees and was awarded $50,000 US in compensatory damages. Robert Reich, the Secretary of Labor, criticized a number of EPA managers, including the Director of the ODW that regulates fluoride levels, for acting improperly in discharging Marcus. Is it possible that people in Canadian organizations want to speak out but are afraid to lose their jobs because they are threatened? If you are one of them please do not hesitate to speak out.

12. HEALTH CANADA FOOD AND DRUG ADMINISTRATION, SAYS IT IS SAFE:

For the past years, the American Dental Association warned parents that if **their tap water is fluoridated** they shouldn't use it to make infant formula. The concern? It could cause children to develop mottled teeth and brain damage. When Fluoride so good for us why this warning?

Recently, the Food and Drug Administration has been gleefully warning us about the dangers of China-made food and personal care products. Why gleefully? Because announcing the discovery of toxic chemicals in products made by other countries allows the FDA and Health Canada, The Canadian Food Inspection Agency (CFIA), to appear as if it's doing their job by protecting the public without having to tell the truth about the danger of Fluoride which is more poisonous then lead. http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/lead-plomb-eng.php)

Dentists make their living from filling cavities due to tooth decay. Fluoride reduces the frequency of decay and therefore is responsible for the reduction in a dentist's income - it negatively impacts their personal income. So the question is who are those individuals behind Dental associations, and similar organizations, to tell us that fluoride is good for us? What is the reasoning that they are hurting their member's income and what is behind it that is not known to us?

Here is the original document from World health Organization in regards to fluoride. You will be surprise to see the lies we are told by our Health organizations and Health Canada.
http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water_full.pdf

13. LETHAL DOSE FOR FLUORIDE:

According to the Journal of Dental Research 1987 -66: 1056-60 Fluoride is a poison. Lethal dose for fluoride for most adult is estimated at 5 to 10 g that is equivalent to 32 to 64 mg of elemental fluoride per kg of body weight. However, a case of a fatal poisoning of an adult with only 4 grams of sodium fluoride is documented.

A State Supreme Court jury awarded $750,000 to the parents of a 3-year-old Brooklyn boy who, on his first trip to the dentist in 1974, was given a lethal dose of fluoride at a city dental clinic and then ignored for nearly five hours in the waiting rooms of a pediatric clinic and Brook dale Hospital while his mother pleaded for help, and he lapsed into a coma and died. Does it make you very angry? Let me tell you it does to me.

Unfortunately our doctors are not trained to diagnose or treat fluorine poisoning. Laboratories in Canada do not provide the testing required assessing fluoride levels in blood and urine when such tests are available in Europe.

In Ontario no one has assessed increased cost on our health system due to fluoridation into our water but a study in U.S.A. shows that it is over a trillion dollars. So fluoridation is not just damaging our health but also it is very costly. According to our Prime Minister there is a good possibility that federal Government is going to cut health subsidy to the provinces. Now it is the time for us to locate and eliminate the root causes for the staggering health cost. FLUORIDE PROVEN INEFFECTIVE:

Fluoride compounds in water and in supplements do not provide any significant cavity-protecting effects. All of the recent large-scale studies of water fluoridation have shown that there are no positive effects. That is why cities and towns without fluoridation have shown an equal improvement in dental health as those with fluoridation. There is scientific evidence that excessive fluoride exposure leads to increased

levels of caries. Even pro-fluoridation scientists admit that there is not any properly conducted research showing that fluoride supplements help prevent cavities.

14. MIXING ALUMINUM SULFATE AND FLUORIDE:

Many municipal water supplies are treated with both alum (aluminum sulfate) and fluoride. These two chemicals combine with each other easily in the blood to form aluminum fluoride. Although aluminum alone cannot pass the blood-brain barrier, some compounds such as aluminum fluoride do. Aluminum fluoride is very poorly excreted in the urine. It is poisonous to the kidneys. Researchers in USA found aluminum salts in the brain lead to Alzheimer's disease.

15 .DESIGNATED AS DANGEROUS GOODS:

Sodium fluoride (NaF), sodium silicofluoride (Na2SiF6) and hydrofluosilicic acid (H2SiF6) are designated as ***Dangerous Goods*** under the Canadian Transportation of Dangerous Goods Act, 1992. But we are told that when it is added to our drinking water it becomes healthy and safe. What an amazing world of Canadian Science.

16.THE WONDER CHEMICAL DDT:

Following World War II, DDT (dichloro-diphenyl-trichloroethane) was promoted as a wonder-chemical - the simple solution to protect humans from pest problems. It became a billion dollar industry. Then nearly 40 years later DDT was banned as it was proven it causes breast cancer. Women with breast cancer remember the times, when as children, on hot summer days they ran after trucks, spreading the cool mist of DDT, as it was being sprayed to kill mosquitoes. Barbara Cohn, an epidemiologist, found an association of early exposure to DDT, to the development of breast cancer. It was also found that there was a link of DDT exposure to neurological disorders.

We are still exposed to DDT through our food. Animal and fatty foods contain the highest levels of DDT because they are stored in fat and increase in concentration as they move up the food chain. Even though it was banned in 1972, vegetables, meat, fish and dairy products contain DDT because it is grown on soil where DDT is sprayed. DDT builds up in sediment in rivers, lakes, and coastal areas, and then accumulates in fish. Women who consume DDT in their diet pass it on to their children in breast milk; infants may get 6% to 12% of their lifetime exposure to DDT from breastfeeding.

May be 20 years from today fluoridation in to our water will be ban but it will be too late for those who lost their physical or mental health, may be their life.

If you are wondering why this most dangerous hydrofluosilicic acid (H2SiF6) is dumped in to our drinking water without having any true scientific research by the medical authorities in Canada then the answer will be: poor knowledge of science combined with corporate greed; political ignorance and so called millions of dollars in medical education budget that are paving the way.

17. EUROPEAN COUNTRIES BAN FLUORIDE IN WATER:

After much research and study many European countries found that there are links from fluoride consumption to cancer, osteoporosis, and other physical ailments including neurological and

cerebrovascular affects. Fluoride in water has now been banned in 93% European countries. It is funny that their children's teeth have not suffered from this rejection. So why we are told in Canada that fluoride in water is necessary to protect our teeth from tooth decay? Ask yourself is it true that our health officers with with Ph.D. in brick laying science is better than biochemist they have in Europe?

In Germany: *"The argumentation of the Federal Ministry of Health against a general permission of fluoridation of drinking water is the problematic nature of compulsion medication".*

In Belgium: it is "*the fundamental position of the drinking water sector that it is not its task to deliver medicinal treatment to people. This is the sole responsibility of health services".*

In Luxembourg: "*In our views, drinking water isn't the suitable way for medicinal treatment and that people needing an addition of fluoride can decide by their own to use the most appropriate way".*

Therefore, why we are still adding fluoride in our water? Because our Canadian scientists and Canadian health organizations feel they know better than all the European scientists combined. The question is - are we getting our money's worth?

18. FLUORIDATION IS AN INJUSTICE:

Audrey Adams, Board Member of Washington Action for Safe Water Fluoridation said fluoridation is an Environmental *injustice* to vulnerable populations:

- Fluoridation is an injustice upon those with chemical sensitivities who cannot drink, eat foods prepared with or bathe in fluoridated water without suffering serious health consequences, affecting a disproportionate number of children and adults with autism.
- Fluoridation is an injustice because one-third of children living in fluoridated communities are expected to have dental fluorosis from excess fluoride and it is unreasonable to assume that a drug potent and toxic enough to permanently change the interior of the tooth has no effect on other organs, bones or health.
- Fluoridation is an injustice against seniors because of the increase of bone fractures in fluoridated areas, which can be fatal for the most vulnerable elderly.
- Fluoridation is an injustice against people of color because studies have shown blood lead levels higher in blacks than whites in fluoridated compared to unfluoridated areas.
- Fluoridation is an injustice to children and adults with neurological disorders (including autism) and mental retardation because excess fluoride increases the rate of mental retardation, up to double in fluoridated areas compared to unfluoridated areas.
- Fluoridation is an injustice to babies fed infant formula mixed with fluoridated water because those babies will receive 250 times more fluoride than a baby on mother's milk.
- Fluoridation is an injustice to the poor, particularly, because they have no access to expensive fluoride-removal filtration systems, cannot transport bottled water from the store to their homes without a car, cannot afford to buy safe water for their babies and still do not have adequate access to dental care, have no better dental health than unfluoridated people but do have unnecessary health risks to because of it.

Therefore, why we are forced to have fluoride in our water? Why they care so much our teeth or may be something else we do not know.

19. FLUORIDE PROVIDES LITTLE BENEFIT BUT MANY RISKS:

a) ***Neurotoxic and Lower IQ*:** In 1995, neurotoxicologist and former Director of toxicology at Forsyth Dental Center in Boston, Dr. Phyllis Mullenix published research showing that fluoride built up in the brains of animals when exposed to moderate levels damage to the brain occurred and the behavior patterns of the animals were adversely affected. Offspring of pregnant animals receiving relatively low doses of fluoride showed permanent effects to the brain, which were seen as hyperactivity (ADD-like symptoms). Young animals and adult animals given fluoride experienced the opposite effect -- hyperactivity or sluggishness. The toxic effects of fluoride on the central nervous system were subsequently confirmed by previously classified government research. Two new epidemiological studies, which tend to confirm fluoride's neurotoxic effects on the brain, have shown that children exposed to higher levels of fluoride had lower IQs.

b) ***Alzheimer's Disease and Dementia*:** A study published in Brain Research shows that rats drinking only 1 part per million fluorides (NaF) in water had histologic lesions in their brain similar to Alzheimer's disease and dementia. In addition, evidence was seen pointing to possible damage to the blood brain barrier from extended fluoride exposure. This study was the third in a series of papers published by Varner et al. Brain Research Vol. 784 No. 12 p 284-298 (1998). Results of this recent study and other studies showing significant dangers from low-level fluoride exposure were presented at a recent scientific symposium.

c) ***Cancer*:** The Department of Health in New Jersey found that bone cancer in male children was between two and seven times greater in areas where water was fluoridated. U.S. Environmental Protection Agency (EPA) researchers confirmed the bone cancer-causing effects of fluoride at low levels in an animal model. A new study has shown that fluoridation of water is linked to uterine cancer deaths. A recently published ecological study (Tohyama, 1996) did find a significant correlation between fluoride concentration in drinking water and uterine cancer mortality in twenty municipalities in Okinawa, Japan.

d) ***Skeletal Fluorosis & Bone Structure*:** Fluoride gradually builds up in the bones and causes adverse changes to the bone structure. Quite a few studies have shown that fluoridation leads to increases in hip fractures. The tensile strength of the hip is destroyed over time by fluoride ingestion. Three other papers all published in the Journal of the American Medical Association, showed statistically significant relationships between water fluoridation and increased hip fractures. More recently a French study found an 86% increase in hip fracture rates amongst elderly French people living in regions with fluoridated water.

Fluoride can cause severe skeletal fluorosis at high levels. Chronic, long-term exposure to levels of fluoride commonly found in water and food can cause the beginning stages of skeletal fluorosis including: pains in bones and joints, sensations of burning, pricking, and tingling in the limbs, muscle weakness, chronic fatigue, gastrointestinal disorders, reduced appetite, backache, osteoarthritis, etc. In fact, decades of ingestion of fluoride from water and other common sources can be expected to cause these symptoms in large numbers of people based on calculations of fluoride intake and excretion. (Keep in mind that fluoride is a cumulative poison because it builds up in the body of years.) Very few healthcare practitioners are capable of diagnosing such a condition because healthcare practitioners are not trained to test for or recognize the effects of chronic poisoning from fluoride.

e) ***Causes Birth Defects and Perinatal Deaths:*** A toxicologist in the United Kingdom recently found that perinatal deaths in a fluoridated area was 15% higher than in neighboring non-fluoridated areas. The fluoridated area also had a 30% higher rate of Down's syndrome. Chile banned fluoridation because of research by the world-renowned researcher, Dr. Albert Schatz, which showed a link to infant deaths due to fluoridation.

f) ***Impairs Immune System:*** Independent research has shown that fluoride impairs the functioning of the immune system. In the United States, where toxic fluoride compounds are regularly added to water and given to children since the 1960s and 1970s, we are beginning to see an overwhelming number of people of that generation who are developing chronic immune system disorders. Dr. John Yiamouyiannis estimates that 30,000 - 50,000 people will die from fluoride poisoning each year.

g) ***Fluoride The Aging Factor***, he lists studies describing fluoride's negative effects on the immune system. Many studies have found that people living in fluoridated areas had a decreased migration rate of white blood cells. Other studies describe genetic and chromosomal damage to animals drinking fluoridated water. He warns, *"Before any disease is even noticeable, the acceleration of the aging process by fluoride is already occurring at the biochemical level, by means of enzyme inhibition, collagen breakdown, genetic damage and/or disruption of the immune system."*

Our immune system is composed of white blood cells including phagocyte cells that are carried in the blood system. If there is an infection or cancer or some foreign agent, these phagocytes will go to that area and start engulfing and destroying this bad agent whether it is a cancer cell or a bacterium or virus. Studies from the University of Glasgow show that fluoride inhibits these white blood cells. Fluoride at levels below one part per million causes a chronic release of these free radicals from the white blood cell out into the blood stream where it starts slowly damaging your body by increasing free radicals. This is one of the reasons why we call *fluoride the aging factor.*

h) ***Acute Adverse Reactions:*** Several double-blind studies have shown that fluoridated water can often cause acute adverse reactions (in addition to the chronic poisoning effects). Some of the effects seen in double-blind studies include: gastrointestinal symptoms, stomatitis, joint pains, polydipsia, headaches, visual disturbances, muscular weakness, and extreme tiredness.

i) ***Teeth Disfigurement in Children (dental fluorosis):*** A very large and increasing number of children are experiencing dental fluorosis which is a permanent adverse structural change to the teeth. Children with fluoride-discolored teeth (dental fluorosis) are more likely to have bone damage, according to a study published in the journal "*Fluoride*." Wrist x-rays reveal that 96% of those children with dental fluorosis had *developmental skeletal abnormalities* including carpal bone hardening or thickening

j) ***Increases harmful metal Exposure:*** Fluoride compounds put into water possibly contaminated with heavy metals such as lead also arsenic and radio nuclides since the fluoride compounds are toxic waste by-products which largely come from pollution scrubbers of fertilizer plants. A study published in 2000 showed that the dumping of toxic silicofluoride compounds into water causes an increase in blood lead levels in children.

An U.S. laboratory analyses shows the following impurities in concentrated fluoride byproduct used for

water fluoridation.

	Percentage of Samples with Detectable Levels	Mean Contaminant Concentration in all samples (ppb)	Mean Contaminant Concentration in detectable samples (ppb)	Maximum Contaminant Concentration in detectable samples (ppb)	NSF/ANSI Standard 60 Single Product Allowable Concentration	US EPA Maximum Contaminant or Action Level
Antimony	0%	ND	ND	ND	0.6	6
Arsenic	43%	0.12	0.29	0.6	1	10
Barium	<1%	0.001	0.3	0.3	200	2000
Beryllium	0%	ND	ND	ND	0.4	4
Cadmium	1%	0.001	0.08	0.12	0.5	5
Chromium	<1%	0.001	0.15	0.2	10	100
Lead	2%	0.005	0.24	0.6	1.5	15
Copper	3%	0.02	0.68	2.6	130	1300
Mercury	<1%	0.0002	0.04	0.04	0.2	2
Radionuclides –beta mrem/yr	0%	ND	ND	ND	0.4	4
Radionuclides– alpha pCi/L	0%	ND	ND	ND	1.5	15
Selenium	<1%	0.016	1.95	3.2	5	50
Thallium	<1%	0.0003	0.04	0.06	0.2	2

k) ***Osteoarthritis:*** In a study published in Rheumatology International in 2001, researchers found a link between fluoride exposure and the development of osteoarthritis. The level of exposure that caused osteoarthritis is common in the United States and Canada.

l) ***Suppresses Thyroid Function:*** Thyroid hormones are extremely important in the regulation of metabolic processes and brain development. Every cell in the body depends upon thyroid hormones for regulation of their metabolism.

There is clear evidence that small amounts of fluoride added to water supplies, present potential risks to the thyroid gland, according to the 2006 National Research Council's (NRC) first-ever published review of the fluoride/thyroid literature: Fluoride, in different form is injected into our public water supplies, ostensibly to reduce tooth decay, but was never safety-tested. "*Many of us are exposed to fluoride in the ranges associated with thyroid effects, especially for people with iodine deficiency,"* says Kathleen Thiessen, PhD, co-author of the government-sponsored NRC report.

In the thyroid gland, fluoride can prevent iodine from playing its proper role in synthesizing two hormones critical for normal metabolic activity throughout the body—T3 (triiodothyronine) and T4

(thyroxine). How does low thyroid affect your face? Every skin cell in our body has a receptor for thyroid (and every other) hormone. So if there is not enough thyroid hormone circulating around, then our skin will dry out. The skin on our face is very much affected by our thyroid activity. If our overall skin is dry from a lack of thyroid then our face will be dry, flat and prone to wrinkles. Those crow's feet around the eyes will also become very prominent.

Common thyroid symptoms include fatigue, weight gain, constipation, fuzzy thinking, low blood pressure, fluid retention, depression, body pain, slow reflexes, and more. It's estimated that 59 million people in North American have thyroid conditions.

Acute Poisonings: Fluoride is an extremely poisonous substance even at exceptionally low doses and has caused a large number of acute poisonings. This is why a poison warning is now required on fluoridated toothpastes sold in the U.S. (See Picture above)

m) ***Experts Oppose Fluoride into Water:*** It stated in an official union statement that over 1500 professionals at the U.S.'s EPA, including toxicologists and risk assessment experts, voted unanimously to oppose the fluoridation initiative in California because of the health risks involved.

n) ***Brain Damage to Fetus & Infants***: The blood-brain barrier is considerably undeveloped during pregnancy and is still undeveloped until the 6th week of life. Fluoride crosses the placenta and gets into every type of tissue although it is found more in bones and the brain. The placenta has not evolved to filter out the very small fluoride atoms (anions). Since fluoride is not an essential element and is not needed to improve the structure of embryonic bones, fetal growth is negatively affected because *fluoride is an enzyme inhibitor*. Three studies (Yu 1996; Du 1992; Han 1989) have found that fluoride accumulates in the brain of the fetus, causing damage to cells and neurotransmitters and one study (Li 2004) has found a correlation between exposure to fluoride during fetal development and behavioral deficits among neonates.

The nation's leading fluoride advocate, The American Dental Association (ADA), issued an alert on November 9th (2006) urging parents to avoid fluoridated water when reconstituting infant formula, warning that "*Infants less than one year old may be getting more than the optimal amount of fluoride if their primary source of nutrition is powdered or liquid infant formula mixed with water containing fluoride."* American dentists are now worried that fluoride exposure at this age will permanently damage their teeth, not protect them.

Premature infants have to wait even longer before the blood-brain barrier is fully resistant to fluoride and those fed on baby formula made with fluoridated tap water are challenged for a longer periods due to fluoride getting into the brain, tissues and bones. Moreover, there will be a certain amount of absorption of fluoride through the delicate skin during bath time Breast-fed babies are in less danger at this stage because the human breast filters out fluoride even if the mother continues to drink fluoridated water and eat fluoridated food. At least 23 research studies throughout the World have measured the intelligence of children born in fluoridated regions and most found that intelligence was reduced in these regions compared with similar groups in non-fluoridated regions.

o) ***Puberty in child:*** American and Canadian girls are reaching puberty at younger ages than ever before. In the 1990s, breast development -- the first sign of puberty in girls -- at age 8 was considered an abnormal event that should be investigated by an endocrinologist.

However, by 1999, following a 1997 study that found almost half of poor African Americans and 15 percent of whites had begun breast development by age 8.

In reality, something is wrong, very wrong, when 5-, 6- and 8-year-old girls are starting puberty. Some studies have even found girls as young as 2 who are starting sexual development. It is not normal when we see our daughter developing before age eight her breasts, armpit or pubic hair, first menstruation and our son before 9 developing, enlarged testicles and penis, armpit, pubic and facial hair. Not only do these children have to deal with an unfairly increased risk of breast or prostate cancer down the road, but they lose precious years of their childhood because their bodies have matured faster than their minds.

Fluoride intoxication could be one of the explanations for why there are so many *wild* young teenage girls and why there are so many teenage pregnancies. *"Is the dental hygiene's policy of fluoridating us largely responsible for sexualizing our children?"* says Dr. Vyvyan Howard, a PhD, fetal pathologist, who is a professor of developmental toxic pathology at the University of Liverpool and University of Ulster, president of the International Society of Doctors for the Environment.

The Journal of the American Medical Association stated in their September 18, 1943 issue that fluorides are general protoplasmic poisons that change the permeability of the cell membrane by certain enzymes.

And, an editorial published in the Journal of the American Dental Association, October 1, 1944, stated: *"Drinking water containing as little as 1.2 ppm fluoride will cause developmental disturbances.*

Just recently a boy of 12 years old in Canada was arrested because he sexually assaulted three children under four years old. How it is possible that 12 years old sexually matured so early age? So why that boy should be punished not the health officials?

p) ***Lower IQ.*** Dr. Howard is the former president of the Royal Microscopical Society and the International Society for Stereology, and general editor of the Journal of Microscopy. In a 2008 Canadian television interview she stated that studies done in several countries show that a child's IQ is likely to be lower in areas with high levels of fluoride. She said that these studies are plausible because fluoride is known to affect the thyroid hormone, which affects intelligence, and fluoride is also a known neurotoxicant. Such studies never been conducted in Canada.

NEW YORK, Dec. 21, 2010 /PRNewswire-US Newswire/ -- Exposure to fluoride may lower children's intelligence says a study pre-published in *Environmental Health Perspectives*, a publication of the National Institute of Environmental Health Sciences (online December 17, 2010).

In this study, 512 children aged 8-13 years in two Chinese villages were studied and tested – Wamaio with an average of 2.47 mg/L water fluoride (range 0.57-4.50 mg/L) and Xinhuai averaging 0.36 mg/L (range 0.18-0.76 mg/L). The study discovered that the children living in a village that had high levels of fluoride in the water supply had overall lower IQ levels and higher levels of mental retardation than

similar children in a village with low levels of fluoride in their water. About 28% of the children in the low-fluoride area scored as bright, normal or higher intelligence compared to only 8% in the "high" fluoride
In addition to this study, and the 23 other IQ studies, there have been over 100 animal studies linking fluoride to brain damage. Twenty-three human studies that report an association of lowered IQ with fluoride exposure. http://fluoridealert.org/caseagainstfluoride.appendices.html)

When the National Research Council of the National Academies reviewed this topic in their 507-page report "Fluoride in Drinking Water: A Review of EPA's Standards" published in 2006, only 5 of the 24 IQ studies were available in English. Even so the panel found the link between fluoride exposure and lowered IQ both consistent and "plausible."

q) ***Accumulation in Brain:*** One scientist - Jennifer Luke (Luke's 1997 PhD dissertation on the topic.) - *alleged* in a 2001 scientific article that fluoride accumulates in the brain (specifically, in the structure of the pineal gland) more than it accumulates in our teeth doing more harm than good. As with other calcifying tissues, the pineal gland can accumulate fluoride (Luke 1997, 2001).

r) ***Direct Toxic Effects in Brain Tissue:*** Over 40 animal studies in Europe and in USA published since 1992 documented considerable evidence of direct toxic effects of fluoride on brain tissue, even at levels as low as 1ppm fluoride in water (Varner 1998). These effects include:

- Reduction in nicotinic acetylcholine receptors.
- Reduction in lipid content.
- Impaired anti-oxidant defense systems.
- Damage to the hippocampus.
- Damage to the purkinje cells.
- Increased uptake of aluminum.
- Formation of beta-amyloid plaques (the classic brain abnormality in Alzheimer's disease).
- Exacerbation of lesions induced by iodine deficiency.
- Accumulation of fluoride in the pineal gland.

s) ***Cell Death in HL-60 (Human Leukemia):*** Dr. Anuradha and colleagues found that fluoride caused apoptosis in the human leukemia cells by activating an enzyme called caspase-3, which has been identified as a key mediator of apoptosis of cells in humans and other mammals. *"The results clearly suggest that fluoride causes cell death in HL-60 (human leukemia) cells by causing the activation of caspase-3 which in turn cleaves PARP leading to DNA damage and ultimately cell death*

t) ***Fluoride & the Kidneys:*** A group of researchers indicate that patients with chronic renal insufficiency are at an increased risk of chronic fluoride toxicity. Patients with reduced glomerular filtration rates have a decreased ability to excrete fluoride in the urine. The National Kidney Foundation and the Kidney Health Australia express concern about fluoride retention in kidney patients.

u) ***Lung Cancer:*** A Hamilton family doctor said that fluoride - the highly touted tooth decay inhibitor – cause lung cancer. The physician notes that garden vegetables in Hamilton contain 20 to 130 times the permitted levels of fluoride. Dr. Victor Cecilioni, a member of the Canadian Medical Association's Committee on Air Pollution, told the Canadian Public Health Association's first national conference on

occupational health held in Toronto recently stated that Hamilton has two dubious distinctions among Canadian cities – heavily polluted air and a high incidence of lung cancer: *"The Economic Council of Canada in 1974 ranked Hamilton as having the third worst air quality of eleven Canadian cities surveyed for clean air, being barely beaten out by Windsor and Montreal".*

v) ***FLUORIDE AFFECTS THE DNA REPAIR*** **MECHANISM.** In each one of our cells we have genetic material called DNA, and this DNA is double stranded, it has a helix shape and semi-strong bonds called hydrogen bonds hold these two strands of DNA together. Hydrogen bonds also hold proteins together. Fluoride goes in and breaks those hydrogen bonds, and consequently destabilizes DNA. It can't cause a lesion in the DNA itself, but if it is in a site of the cell that regulates cell growth, it will cause uncontrolled cell growth. A few minor modifications will give you first a tumor, and secondly an invasive tumor or cancer. So fluoride has the ability to actually cause the cancer. We have a marvelous DNA repair enzyme system. So any lesion caused by the sun or ultra-violet light will be repaired. The unfortunate thing is that one part per million fluorides, the amount of fluoride that they use in the public water system, depresses the DNA repair system by 50%. So they have attacked us on the first defense of damage to our genetic material. Since people can get cancer from so many different causes, fluoride is just increasing our chances of getting cancer.

20. COURT CASES AND JUDGES COMMENTS AGAINST FLUORIDATION:

a) Aitkenhead v. Borough of West View Water Authority.

Judge Flaherty's Nov 16, 1978 decision:

- "The sole issue before the court is whether or not fluoride may be a carcinogen. The issue of whether fluoride protects children's teeth was not before the court. This court ruled that no action to prevent a non-fatal dental condition could be justified if such action, might result in even one death."

- Ruling: "Whenever the public health may be threatened, a court of equity has a duty to act. Therefore, a preliminary injunction prohibiting the addition of fluoride to the water supply at the Neville Island facility of the West View Water Authority shall issue."

b) Illinois Pure Water Committee v. Director of Public Health

Judge Ronald Niemann's February 26, 1982 decision:

- "A conclusion that fluoride is a safe and effective means of promoting dental health cannot be supported by this record."

- And: "There is a failure of the State to explain even the scope of the potential risks involved."

- And: "Is this Court required to close it's eyes to the risks and await for someone in state government at some future date to say that new findings have left them concerned…"

- And: "This record is barren of any credible and reputable, scientific epidemiological studies and/or analysis of statistical data which would support the Illinois Legislature's determination that fluoridation of public water supplies is both safe and effective means of promoting public health."

- ❖ Ruling: "It is Ordered and Decreed that in light of the evidence and reasonable inferences drawn therefrom, and state of law applicable, the enforcement of Ill. Rev. Stat. Ch. 111-1/2, Sec. 121gl by William L. Kempiners, or his successor in office and the Illinois Department of Public Health and Michael P. Mauzy, or his successor in office, and the Illinois Environmental Protection Agency is an unreasonable exercise of police power, and therefore, they are enjoined from any future enforcement of the statute (mandatory state fluoridation) in question."

c) Safe Water Foundation of Texas v. City of Houston

Judge Farris's May 24, 1982 decision:

d) "…artificial fluoridation of public water supplies…may cause or may contribute to the cause of cancer, genetic damage, intolerant reactions, chronic toxicity, including dental mottling, in man; and that the value of said artificial fluoridation is in some doubt as to the reduction of tooth decay in man."

e) M'Coll v. Strathclyde Regional Council S.C 225

Lord Jauncy's June 29, 1983 decision:

- ❖ "…fluoridation of the water supply with the view to improving the general dental health of the populace which in no way facilitated nor was incidental to the supply of wholesome water was out with the powers of the Regional Council."
- ❖ And: "I see no reason why a local body, so long as it acts in good faith, should not be entitled to take any reasonable steps it thinks proper to improve the quality of its available water supply as water. I agree that it must not attempt to introduce a substance which is foreign to the nature of the water for medical or other purposes, for this would render the water 'impure'."

- ❖ And: "It follows that fluoridation which in no way facilitates nor is incidental to the supply of such water is out with the powers of the respondents. The petitioner therefore succeeds on this branch of her case."

- ❖ Ruling: "I shall therefore repel the first and third pleas-in-law for the petitioner, sustain her second plea-in-law and grant interdict."

f) Toronto v. Forest Hill, 9 D.L.R. 2d at 114-15

Mr. Justice Rand ruling:

- ❖ "But (the statute) is not to promote the ordinary use of water as a physical requisite for the body that fluoridation is proposed. That process has a distinct and different purpose; it is not a means to an end of wholesome water for water's function but to an end of a special health purpose for which water supply is made use of as a means."

- ❖ Ruling: "In pith and substance the by-law relates not to the provision of a water supply but to the compulsory preventive medication of the inhabitants of the area. In my opinion, the words of the statutory provisions on which the appellant relies do not confer upon the council the power to make by-laws in relation to matters of this sort."

g) Campbell v. Kingsville (1929) 4 D.L.R 772

- *Pg. 772 of the ruling*: "A municipality which negligently fails to take adequate precautions to ensure the purity of its water supply will be liable in damages to a taxpayer who sustains loss by reason of the death of a member of his family from drinking same.

h) Paul M and Verla Martin v. Reynolds Metals (1955)

The judge ruled that the couple had sustained:

- "serious injury to their livers, kidneys and digestive functions" from eating: "farm produce contaminated by (fluoride) fumes" - awarding them damages.

i) Sask. V. Redberry Dev. Corp. 2 C.E.L.R (N.S)

Pg. 12 of the ruling:

- "I am of the opinion that the respondents are clearly in breach of the statue and as the project is likely to cause widespread public concern because of the potential environmental changes, the public interest in having the law obeyed must outweigh any hardship the injunction would impose on the respondents."

j) R. v. Nitrochem 14 C.E.L.R (N.S) 151

Pg. 158 of the ruling:

- "The test of inconsistency recognized by the courts as to whether a provincial law is to be rendered inoperative under the doctrine of *paramountcy* has progressed over the years from one of 'covering the field' to one of express contradiction where the compliance with one law involves the breach of the other."

- Pg. 162: "The defendants must establish on the balance of probabilities that they were duly diligent, that is, they must establish that they exercised all reasonable care by establishing a proper system to prevent commission of the offence and by taking reasonable steps to ensure the effective operation of the system."

k) R. v. MacMillian Bloedal Ltd. 12 C.E.L.R (N.S) 230

Pg. 231 of the ruling:

- *"*To obtain a conviction under sec.16(1) of the Act, the Crown must prove that the material discharged may have impaired, or had the potential to impair water quality. It is the nature of the substance and not the quantity that determines whether it may impair water quality. There is no requirement that the Crown prove actual harm."

l) Spraytech v. Town of Hudson 2001 SCC 40

Pg.231 of the ruling:

- "The interpretation of By-law 270 set out here respects international law's *'precautionary principle'*. In the context of the precautionary principle's tenets, the Town's concerns about pesticides fit well under their rubric of preventive action."

m) R. v. Crown Zellerbach Canada Ltd. SCC March 24, 1988

Pg.16 of the ruling:

- "In their Lordship's opinion, the true test must be found in the real subject matter of the legislation: if it is of such that it goes beyond local and provincial concern or interest and must from its inherent nature be the concern of the Dominion as a whole, then it will fall within the competence of the Dominion Parliament as a matter affecting the peace, order and good government of Canada, though it may in another aspect touch on matters specially reserved to provincial legislatures. War and pestilence, no doubt, are instances: so, too, may be drink or drug traffic, or the carrying of arms."

n) Laporte v. Laganiere C.R.N.S Vol. 18 pg.357

Pg.361 of the ruling:

- "Every medical interference with the body of another is a prima facie assault; to justify such assault and escape both civil and criminal responsibility therefore, the physician or surgeon must be able to demonstrate either (1) that there was valid consent given by or on behalf of the patient, or (2) that the situation was one of extreme urgency, that the acts done were reasonably necessary for the preservation of life or safety of the patient and that the latter condition was such as to make the requisite consent impossible."

- Pg.363: "The integrity of an individual's person is a cherished value of our society. That we today hold that the constitution does not forbid the states minor intrusions into an individual's body under stringent limited conditions in no way indicates that it permits more substantial intrusions, or intrusions under other conditions."

o) R. v. Oakes (1986) 1 S.C.R

Pg.138 of the ruling:

- "…must be of sufficient importance to warrant overriding a constitutionally protected right of freedom."

- Pg.139: "…must show the means chosen are reasonable and demonstrably justified."

- Pg.139: "Third, there must be a proportionality between the effects of the measures which are responsible for limiting the Charter right or freedom, and the objective which has been identified as 'sufficient importance'."

p) Jacobson v. Massachusetts (1911)

Ruling:

- "If there is any power in the judiciary to review legislative action in respect of a matter affecting the general welfare, it can only be when that which the legislature has done comes within the rule that, if a statute purporting to have been enacted to protect the public health, the public morals, or the public safety, has no real or substantial relation to those objects, or is, beyond all question, a plain, palpable invasion of rights secured by the fundamental law, it is the duty of the courts to so adjudge, and thereby give effect to the Constitution."

q) Schloendroff v. The Society of the New York Hospital (1914) 211 N.Y. 125 at 129

Judge Cardozo heard the Schoendroff case and ruled:

- "Every human being of adult years and sound mind has a right to determine what shall be done with his own body."

r) More legal actions:

i. Federal District Court for the Southern District of California as Case No. 11CV1765 JLS (BLM).

ii. Clallam Country Citizens v. City of Port Angeles and City of Forks.

iii. Nemphos v Nestle-Gerber. Case 1.11-cv-02423-CCB, Document 1, Filed 08/29/2011

iv. ·Oshlack v. Rous Water, 2011. In the court of land and environmental New South Wales, Australia.

v. Court case (case # 30272, Kevin James Millership v. The City of Kamloops, The Province of British Columbia, and The Federal Government of Canada. Supreme Court of British Columbia, Kamloops Registry) on October 23, 2000.

21. IMPORTANT LAWS TO KNOW :

a) Canadian Dental Law. L. Rozovsky. Published by Butterworth (1987)

- Pg.109-110: "Compulsory vaccination legislation for school children may also be justified on the basis of the public's interest in protecting itself from a potential threat. These arguments cannot be applied to justify fluoridation since non-fluoridated water cannot be said to be a threat to the public. Dental cavities are also not a threat. Similarly fluoridation does not deal with a current disease but with the possibility of a future problem. Fluoridation to the water supply, according to these arguments, forces individuals to undergo a preventive health measure against a condition which they may not get, is not a danger to the public if they do get it and does nothing for a condition from which they may now be suffering."

b) Traumatic Medicine and Surgery For The Attorney, Vol.7 (1962) Butterworths

- Pg. 591: "Toxic dose: The careless handling of sodium fluoride and of sodium silicafluoride has often resulted in acute poisoning and, being relatively available, it has often been used for suicidal purposes. Severe non-fatal poisonings may result from as little as 0.25-0.45 gram, larger doses being increasingly more toxic and the fatal dose for man has been given as 5-15 gram but much smaller doses of 0.7-1.0 gram have been fatal within 3 1/2 hours."

- Pg. 653: "The minimum toxic dose of colloidal lead has been given as 40 grams for females and 100 grams for males. The fatal oral dose of lead acetate has been given as from 20 grams to over 50 grams, that of lead carbonate as 23-40 grams, and it has been stated that the smallest oral dose of lead causing acute poisoning is 5 milligrams per kilogram of bodyweight."

c) American Medical Association's Guides to the Evaluation of Permanent Impairment

- States: "To be deemed ‘disabled' for the purpose of the ADA protection, an individual generally must have a physical or mental impairment that substantially limits one or more major life activities. A ‘physical' or mental impairment could be any mental, psychological, or physiological disorder or condition, cosmetic disfigurement…"

- Pg. 66 defines "Disfigurement" as: "An altered or abnormal appearance of color, shaper or structure of the skin or of a body part."

d) Schmidt's Attorneys' Dictionary of Medicine

- Pg. F-86 defines "fluorosis" as: "1. A condition of being chronically poisoned by fluorine or fluorides. 2. A condition marked by an increased density of the bones, discoloration or mottling of the teeth, stiffness of the spine, etc., caused by prolonged intake of an excessive amount of fluorides, as when a community water supply contains too much fluoride (2 or more parts per million in drinking water)."

e) Stedman’s Medical Dictionary, 27 th ed.

- Pg.691 defines "fluorosis" as: "1. A condition caused by an excessive intake of fluorides (2 or more p.p.m. in drinking water), characterized mainly by mottling, staining, or hypoplasia of the enamel of the teeth, although the skeleton bones are also affected. 2. Chronic poisoning of livestock with fluorides that blacken and soften developing teeth and reduce bones to a chalky brittleness; most often caused by ingestion of forage contaminants near large aluminum plants."

22. ONTARIO FLUORIDATION ACT:

The Ontario Fluoridation Act permits the addition of “fluoride ions”. It is silent on the addition of hazardous waste or unregulated fluoride products making specific health claims.

- The Ontario Safe Drinking Water Act (SDWA) legislation (section 20) states clearly that the addition of “drinking water health hazards” is not permitted, and that “dilution [is] no defense.” It is assumed that these man-made toxic substances, as defined by the Canadian Environmental Protection Act, (CEPA) and hazardous waste products are “drinking water health hazards” as defined by the Ontario SDWA (Safe drinking water act).

- The legislation on natural health products, under the *Food and Drugs Act* (FDA), was enacted into law in January 2004. Producers, distributors, purchasers and sellers of these products had until 31 December 2009 to comply with this new legislation. However, Health Canada informed us that no producer, distributor, purchaser or seller of natural fluoridation health products submitted any application for a license for fluoridation agents. Consequently, and in accordance with the legislation, these fluoridation agents are illegal and should neither be sold nor purchased in Canada. Any municipality purchasing these products would therefore be contravening the legislation. In short, on every level—legal, ethical, environmental, and moral—artificial fluoridation of water cannot be considered a sustainable or acceptable measure.

- In its response to Environmental Petition No. 221B, submitted by Carole Clinch under Section

22 of the *Auditor General Act*, Health Canada stated that it had no toxicological study on fluosilicates and that it acknowledges no responsibility for research into their safety: "*Health Canada has not conducted toxicology studies on fluorosilicates (…) The department works with certification and accreditation bodies to meet this goal, but has no mandate or authority regarding the certification process.*"

23. FEW OF NEW LAWSUITS FILED OR TO BE FILE

- Seven residents have filed a multimillion-dollar lawsuit against Regional Water system alleging that contaminated water provided by the Anderson Joint Regional Water System and the Broadway water district caused them to have infections, skin and intestinal problems, and led to the amputation of one man's leg. Attorney and Anderson City Council member Tom Dunaway represents, and spoke on behalf of, the residents. The plaintiffs are seeking a minimum of $7 million — at least $1 million apiece.

- A group of private citizens in San Diego County file a large-scale lawsuit in federal court against public water districts and challenge the constitutionality of using industrial-grade hydrofluosilicic acid to fluoridate drinking water. Jeff Green, national director of Citizens for Safe Drinking Water in San Diego, told WND, "We are raising funds for a lawsuit that has been prepared for plaintiffs who are asserting their constitutional rights under the Ninth and 14th Amendments to be free of what they term 'bodily intrusions' by a water wholesaler adding an unapproved drug into their water."

- Tacoma Washington
  The City of Bonney Lake has joined six water utilities and a grass-roots group in the escalating legal fight against local fluoridation. Bonney Lake has filed the latest lawsuit and asking for $60 million dollars damage against the Tacoma-Pierce County Health Department in an attempt to stop forced fluoridation of drinking water. The lawsuit was filed Nov. 8 in Pierce County Superior Court. The health board recently voted to fluoridate drinking water to prevent and control the spread of tooth decay and related disease. The Oct. 2 order affects 14 water supplies serving 238,000 people throughout the county, including Lakewood, Milton, Steilacoom, Parkland and Spanaway.

- Clallam County, Washington. On April 28, Protect the Peninsula's Future, Clallam County Citizens for Safe Drinking Water, and Eloise Kailin filed suit in superior court against the cities of Forks and Port Angeles, Washington, noting that the fluoride chemicals being used matched the definition for prescription drugs. The suit alleges that the cities lacked the necessary permits for dispensing these drugs. Plaintiffs requested that the practice be halted under search and seizure statutes until permits were obtained.

- Patrick Reeners, of Gallatin, Tennessee on July 19, 2011, in the general sessions court of Sumner County. The suit is against the American Dental Association (ADA), and the complaint was served on the organization's President, Dr. Raymond Gist, DDS. The charge is fraud, false advertising and willful harm. Reeners believes the promotion of water fluoridation as "safe and effective" was never approved by the Food and Drug Administration (FDA). He believes the ADA makes this claim while failing to recognize and fairly report on harmful cumulative contributions of fluoride from multiple non-water sources of fluoride.

Reeners believes that fluoride is portrayed on the Association's website as a totally desirable and harmless means of preventing tooth decay. In particular, Reeners believes that the fluoride additive is promoted as if drinking water provided an appropriate dosage, which might be true if you could control total water consumption. However, people also ingest significant doses of fluoride from many other sources such as food, beverages, dental products, and medication. The suit alleges that the general public is ill-informed of the amounts of fluoride on or in most of these products. For example, brewed black tea reportedly tested at more than three parts per million (ppm) fluoride, three times the one ppm of fluoridated drinking water. White grape juice was reported at 2.7 ppm (EPA report #820-R-10-015 Dec. 2010, page 26).

- Lawsuit was filed on August 9th, 2011, by multiple individual plaintiffs on behalf of the general public interest. The suit was filed in the federal District Court, Southern District of California, against the Metropolitan Water District of Southern California (MWD), which serves some 17 million consumers. The suit alleges willful misrepresentation, deceptive business practices, and infringements on the consumer's constitutional right to be free of bodily intrusion without their consent. This lawsuit challenges the MWD's claims of safely and effectively reducing tooth decay while delivering a drug that has not been approved for MWD's claims for intended use. It alleges that MWD knowingly failed to inform the public and water recipients of the drug's unapproved status or give notice of evidence of significant potential harms from hydrofluorsilicic acid, which would require a full FDA review, approval process, and notice of any contraindications.

  Plaintiffs point to the unique health effects of hydrofluorosilicic acid, which when compared to sodium fluoride, have a disproportionate toxic effect on children, and the fact that consumers are unable to prevent absorption of the chemical through their skin during baths and showers.

THANK YOU FOR YOUR CONSIDERATION

From: P. Van Caulart [mailto:pvancaulart@cogeco.ca]
Sent: Thursday, May 24, 2012 4:57 PM
To: JASON COVEY
Subject: An Obligation and Notice

Mr. Jason Covey, P.Eng.

Notice to Principal is Notice to Agent and without malice, vexation or frivolousness;

It is with empathy that I ask you to reconsider any recommendation you may make regarding the establishment of fluoridation within the City of Orillia's drinking water system. I ask because drinking water supply is one of the sacred trusts to humanity that engineers and other professionals commit to. Drinking water treatment has advanced lifespans of generations and is responsible for lowered rate of infant mortality. While the bulk of this knowledge addresses acute effects of pathogenic disease, there remains much unknown about the chronic effects of consuming small amounts of drinking water contaminants. We still learning that which was standard practice only 30 years ago is harmful today. Traditionally drinking water fluoridation practice was never fully engaged across Canada and has been actively abandoned since the mid '90s. Yet it remains entrenched, mainly in Ontario's GTA. You must ask, "Why is this so?" Primarily it's because politics and policy surrounding another profession's ego and it's desire to be seen as having contributed to the betterment of society. Drinking water fluoridation began as an unproven idea, was developed as a legal defense, then embraced as a health policy and was irrevocably entrenched in popular culture by propaganda. This doesn't make it, sound. Nor gives validity to a notion that ingesting an endocrine disruptor in any amount can be done without any requisite harm, whatsoever. In other words, it's false. Sadly, the falsehood was easily believed in the US under the guise of "wartime necessity" or "in the interests of national security," both euphemisms that later translated into, "for the public good."

Ontario's historical industrial and economic relationship with the US coupled with the proximity of border town broadcast media, helped popularize drinking water fluoridation in Ontario's Southern communities through the 50's and 60's, a time when larger municipalities signed on. At that time fluoridation was viewed by water managers as something progressive. It was an inexpensive trend that came with bragging rights and could be easily sold to gullible politicians who needed to be seen to do something about a public crisis...dental health. But from inception it had critics, some sincere and many crackpots. Through the noise of opposing claims white coats emerged to give assurance by authority that all was fine, thus pacifying the political angst for making health decisions at city council. Those who were sincere in their concerns were marginalized and relegated to obscurity. Read what an eloquent Arthur C. Ford, Water Commissioner of NYC said. He was not wrong, but he was Black and so by racism his message was discounted. It behooves you to hear a fellow engineer speak of his obligation (see attachment) as he believed true for his time.

As the Engineer, you stand in defence of your community against disaster. With prudence, known data and intelligence you can create or destroy. I've attached one other document by Dr Sutton, significant and worthy of your consideration. I urge you to follow through on what sounds true and reject what doesn't. Windsor Utilities Commission has announced they no longer support drinking water fluoridation. Their chief engineer, John Stewart showed impeccable courage in stating what he learned about "the lack of empirical data" surrounding drinking water fluoridation.
http://www.cbc.ca/news/canada/windsor/story/2012/05/24/wdr-fluoride-bill-marra.html

The ring you accepted and wear symbolizes the pride which engineers have in their profession, while simultaneously reminding them of their humility. The ring serves as a reminder to the engineer and others of the engineer's obligation to live by a high standard of professional conduct. I therefore charge you to independently decide on what is the higher standard of conduct. Truly, search your heart and act with integrity, for this choice is one that will make or break your soul.

Most sincerely,

Peter Van Caulart, Dip.AEd., CES, CEI (2nd. Lt. retired, CAF)
Director, Environmental Training Institute, and
VP Canadians Opposed to Fluoridation, COF-COF.ca

Attachment 1:

Note: This 1956 letter from the then New York Water Commissioner Arthur C. Ford is a public response to the City Council's proposal to fluoridate the water supply of New York City. In 1965 New York City began fluoridating the water supply, despite widespread concern. Mr. Ford had also been president of the city's former Department of Water Supply, Gas and Electricity. When he was named to that post in January 1954 by Mayor Robert F. Wagner, Mr. Ford became the first black to be appointed commissioner of a city agency. He was appointed president of the Board, now Bureau, of Water Supply in September 1957, and retired in 1965.

The City of New York
Department of Water Supply, Gas and Electricity
Municipal Building
New York 7, N. Y.

Arthur C. Ford, Commissioner March 13, 1956

Under the City Charter, the Commissioner of the Department of Water Supply, Gas and Electricity is charged with the responsibility of maintaining the purity and wholesomeness of the city water supply. The matter of purity has a direct bearing on the people, and involves the determination and evaluation of the tolerance of suspect, hazardous or toxic substance.

The department has extensive laboratories staffed by reputable scientists and competent sanitary engineers, with a massive library in which is contained over five thousand references on the subject of the fluorides alone. We have continued to study and evaluate the effect of toxic substances as related to water supply. The matter of fluorides has been under our scrutiny for over 20 years.

The addition of fluorides to the water supplies is not coupled with the concern of maintaining or improving the quality of the water or making it safe. No one has suggested that dental caries is a water-born disease or that water is a cause of dental decay. No satisfactory reason has ever been advanced to show why everyone in a community must be compelled to risk life-long extraordinary exposure to the toxic action of fluorides, particularly when safer, more effective and more economical ways of administering fluorides for caries prevention in children's teeth have been pointed out and are available.

Whatever the merits of fluoridation, it would not concern us as a department if the question of water supply safety were not involved. But we are concerned, and, like yourself, in all conscience, our concern is primarily with the safety of the water supply for each and every individual of our entire population of eight million people throughout the City.

We are aware that the fluorides are extremely toxic substances, and evidence exists to show that even at the recommended level of one part per million of fluoride in drinking water, people in fluoridated communities have been harmed. A very small percentage among a population of eight million, sensitive to the chemical and adversely affected, would constitute a serious significant number of persons harmed.

We know of reputable, independent medical authorities throughout the United States and in the local area who have found evidence of fluoride damage to persons living in fluoridated communities. These medical authorities disagree with the fluoride hypothesis, and they have raised grave questions with respect to the safety of the procedure for an entire population, which includes the young, the old, the susceptible and the infirm as well as the healthy.

No one has made a claim that the ingestion of fluoride can be of benefit to the teeth beyond the formative years of childhood. Because of this, and for reasons of safety and economy, this department has proposed that the City distribute fluorine tablets through health stations, free of charge, for parents to administer to children. The cost to the City, ascertained at less then 25 cents for a thousand days supply for each child, would be less than one-fifth of the cost of a fluoridated water program. Tablets (a pharmaceutical grade in contrast with the commercial by-product used in water fluoridation) would provide an exact procedure, under control, to be taken only by those during the formative period of their teeth.

Fluoride, besides being a toxic substance, is not all excreted when taken into the system, a significant percentage remaining cumulatively. Fluoridation of the drinking water at any level of concentration is a very indiscriminate procedure, since children drink widely varying amounts of water, each according to taste, physical activity and seasonal variations of the year. The daily intake of one

child often differs greatly from that of another who may drink milk, fruit juices and soft drinks in abundance. How then, will each child receive its appropriate share of water having a given concentration in parts per million of fluoride?

The problem of managing the control of dosage of fluoride chemical to obtain uniformity throughout a grid work of more than 5000 miles and tunnels involving different sources and pressure gradients, as in the New York system, is formidable.

None of those who have made statements to the contrary have ever had the experience nor do they possess knowledge of what the exact result would be. *Our concern and responsibility in the department is to provide the people of our city with a dependable supply of the purest and safest water possible. No one can guarantee similar safety to all the people in the City of New York under a program using the water supply as a fluoride delivery vehicle.* The people of the City of New York are entitled to know the risk they are being asked to assume before endorsing a program involving so many questions yet unanswered.

Unfortunately the forum on the subject of fluoridation is not as open as it should be, even among professions. Although this reply to your letter is written at length, it is impossible to do more than call attention to the complex nature of your fluoride proposal. There has been too much of mass hysteria, blind following and lack of objective thinking by too many people on both sides of the question. We believe the serious nature of what you are proposing and supporting deserves all of your objectivity in inquiry and thought, and a good look at all of the facts.

Very truly yours,
Arthur C. Ford, Commissioner

Below are late fluoridation data contained in an address before the N.Y. Advertising Club June 27, 1956, by Laboratory Director Benjamin E. Nesin, who is in charge of the rigidly-trained chemical staff having the duty of making safe New York City's water supply.

The Water Supply profession cannot guarantee the comprehensive safety of fluoridation... No matter how carefully fluoride is introduced at the treatment plant, no one is in a position to guarantee the amount which may occur at any particular point in the distribution system, or the more varying amounts consumed by individuals.

The discovery of fluoride in kidney stones is a very recent finding... It must be stated that the support given fluoridation by most of the endorsers has no scientific value... The intake of fluoride is at least three-fold greater - and more likely five times greater - for the individuals living in communities with water supplies fluoridated at the recommended level....

It is indicated that an individual exposed to lifelong ingestion of fluoridated water consumes at least fifty times more than is required for the claimed partial prevention of dental caries in children... Mottling of teeth is inevitable where the water supply is fluoridated at the recommended level.

Dr. Paul Philips, an outstanding investigator in fluoride research, says: ‘Fluoridation cannot meet its proponents' claim that is will prevent caries’... The cumulative effect of fluoride in bones leads to deformity and crippling - an established medical entity....

It is impossible to underwrite fluoridation with a factor of safety... Our Water Dept. does not specifically recommend that any one take fluoride, since it is aware of cases where the very small quantities recommended for children have been toxic... Dr. Alton Ochsner, an outstanding physician-surgeon, states: “I am convinced that there are very few people who know much about fluoridation.” In general it must be stated that the average physician or dentist is not critically informed on the subject....

“It is difficult to see how public health authorities can guarantee the safety of fluoridation... The whole concept of fluoridation is a perversion of hard-earned experience acquired in the development of safe water supply practice."

The universal question asked by those who are truly American, law abiding, health conscious, and uncertain what procedure to follow in protecting the bodies, minds and spiritual welfare of loved ones, is:
"What can we do if, against our will, the water supply is fluoridated?" The answer is simple, but not always easy to carry out, especially in those districts where the sources of water are limited. Do not use fluoridated water in the family either for drinking or cooking purposes. If fresh springs are available, go there for your water supply. If they are not then buy bottled water. It is cheaper than doctor bills for undermined physical and mental ills, and may save you hours, perhaps months or years of mental agony.

While a certain class of the public officials in America are, judged by their activities, hell bent on adulterating the drinking water of the American people with dangerous Toxic drugs, the Supreme Court of Canada denies this privilege to the officials of its water supply.
In a news item published by The Globe and Mail, Canada's leading newspaper, edition June 27, 1957, under the title:

"SUPREME COURT DENIES METRO TORONTO'S RIGHT TO FLUORIDATE WATER
"By Clark Davey
"Globe and Mail Staff Reporter

"Ottawa, June 26. - The Supreme Court of Canada has ruled that Metropolitan Toronto cannot add fluorine compounds to the water which it supplies to the 13 municipalities which make up the metropolitan community.

"As Chief Justice Patrick Kerwin, who dissented, noted in his judgment, the majority decision raises the question whether the other municipalities in Ontario which are already fluoridating their water actually have the power to do so.

"The court's ruling was a 5 to 2 decision to dismiss the appeal of Metropolitan Toronto against an Ontario Appeal Court decision. The Ontario Court had reversed an earlier decision by Mr. Justice F.G. MacKay, who had ruled, in a case brought by Forest Hill against Metro, that the senior municipality was entitled to add fluorine compounds to its water supply.

"Both Mr. Justice Rand and Mr. Justice Cartwright who wrote majority decisions found that Metro Toronto's fluoridation bylaw was not aimed at making the supply of water more pure and wholesome.(1)

(1) This is a conclusion arrived at by all but a few of those who have given time, thought, and a thorough investigation, though it might not be wise for an individual to publicly state such an opinion. However, in order to be perfectly fair and just, it is our personal opinion that there are many men in public life, as well as reputable physicians, who actually believe it would be a good and desirable thing to pollute the public's drinking water with Toxic substances.

"On that basis, the majority found that the municipality had exceeded the jurisdiction granted it by the Ontario Legislature. Finding with Messrs. Justices Rand and Cartwright were Messrs. Justices Robert Taschereau, Fauteux and Abbott.

In effect the court's decision today tosses the problem back at the Ontario Government.

"If the Ontario Legislature means the municipality of Metropolitan Toronto to have the power to add fluorides to its water, Mr. Justice Cartwright noted, the Legislature can make its true intention clear by amending the Metropolitan Toronto Act.

"It was designed, as Mr. Justice Cartwright put it, ‘to cause the inhabitants of the Metropolitan area, whether or not they wished to do so,(2) to ingest daily quantities of fluoride in the expectation that this will render great numbers of them less susceptible to tooth decay."

(2) Evidently the Canadian Supreme Court is jealous of the rights of her people and will not permit them to be oppressed by compulsions such as forcing them to ingest a Toxic substance such as sodium fluoride, in their drinking water, feared by millions as a destroyer of body and mind.

"In his dissent, Chief Justice Kerwin said Metro's action in passing its fluoridation bylaw was not an invasion of the field of public health and there was, therefore, no need to refer to any provincial statue except the Municipality of Metropolitan Toronto Act, Section 41, which gave the council power to pass bylaws which would guarantee an abundant and continued supply of pure and wholesome water.(3)

(3) It might be argued with truth that much of the public drinking water is not pure and wholesome, but if that is true, then certainly diluting it with a highly Toxic substance will not purify it, rather make it all the more dangerous. There are means of purification without the employment of poisonous substances.

"During the Supreme Court hearing, J.J. Robinette, arguing on a brief prepared jointly with J. Ragnar Johnson, Forest Hill solicitor, had claimed that metro Toronto doesn't have the power to administer medication on a mass scale.(4)

(4) And among a free people, or supposedly free people, no man or group of men, should be trusted with such power.

"Carried to an extreme, he said such arguments could mean that Toronto could add orange juice to its water because orange juice is good for babies and would not make the water impure.(5)

(5) This point is well taken, and does credit to Mr. Robinette's sense of reasoning. It is not only a sane reasoning but apropos due to the fact that the vitamins and minerals in oranges are among the most important elements to help preserve healthy teeth. It might be further argued that there are many substances which might be mixed with the water that would be of great benefit to health.

"The argument by Harold Manning, Metro Toronto lawyer, that the addition of fluorine compounds does not affect the quality of wholesome water was rejected by Mr. Justice Rand's decision although he said he found the argument attractive.

"Fluoridation, he said, `is not a means to an end of wholesome water for water's function but to an end of a special health purpose for which a water supply is made use of as a means."(6)

(6) A proper and correct conclusion. It is compulsory mass medication and should have no part in the government of a free people. To sanction it is a first step in mass slavery. If man can be compelled to partake of a poison against his will, than it is certain that he can be forced to do any other thing against his will.

FLUORIDATION

Errors and Omissions in Experimental Trials

Philip R. N. Sutton

Melbourne University Press

FLUORIDATION

Errors and Omissions in Experimental Trials

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PREFACE TO THE SECOND EDITION

Soon after the publication of the first edition of this monograph, in September 1959; copies were sent, by the Australian Dental Association, to the workers in charge of all the studies considered. As a result, critical reviews were published in the February 1960 issue of the Australian Dental Journal. The New Zealand Dental Journal of January 1960 also contained a critical review. These have not indicated the necessity for any modifications in Parts One and Two which are, therefore, reprinted unchanged. However, in this edition a Part Three has been added in which these criticisms are reprinted, at length, and some comments made. It is again stressed that in this book consideration is limited to some aspects of five crucial experimental trials of artificial fluoridation. Results reported from "naturally fluoridated" areas are not considered.

P.R.N.S.

Dental School,
University of Melbourne
June 1960

PREFACE TO THE FIRST EDITION

Endorsements of the process of the mechanical addition of fluorides to public water supplies, with the aim of reducing the incidence of dental caries, rely mainly on the results published from five trials which were set up to test, primarily, the efficacy of this process.

Important deficiencies in the methods used were revealed during a preliminary investigation of reports of these trials. Therefore this study was undertaken in an attempt to answer the question: Can the claims of considerable dental benefits as a result of artificial fluoridation be regarded as established, or are they based on an unsound foundation.

P.R.N.S.

Dental School,
University of Melbourne
February 1959

ORIGINAL ACKNOWLEDGMENTS

MEMBERS of the Department of Statistics, University of Melbourne, have given most careful consideration to all the statistical matters mentioned in Part One of this monograph; they have checked the computations in Part Two and have also given advice regarding statistical matters mentioned in Part Three. Their assistance is gratefully acknowledged. Part One was published in the Medical Journal of Australia, in February 1958, pages 139-140. I should like to express my thanks to my co-author, and to the Editor of the journal for permission to reprint the paper and also to the Editors of the Australian Dental Journal and the New Zealand Dental journal for permission to reprint the book reviews shown in Part Three. Extracts from Part Two were presented at the fifteenth Australian Dental Association Congress, Adelaide, a3-7 February 1959. Professor Sir Arthur Armies and Dr Paul Pincus have suggested improvements to the draft of Part Two, and Miss H. N. Rankine, the Librarian of the Dental School of the University of Melbourne, has given valuable assistance. This investigation has been supported by grants from the University of Melbourne Research Fund.

LATER ACKNOWLEDGMENTS

The family of Dr Sutton wish to particularly thank Mr Glen S.R. Walker for the support and great friendship he gave to their father during his lifetime. They wish also to acknowledge the invaluable hours of learned advice and assistance he so willingly gave to them in preparing this [later] book for publication. [from collected works on P.R.N. Sutton]

FOREWORD

By Professor Albert Schatz, Ph.D., Philadelphia, U.S.A.

(Professor Schatz discovered the antibiotic Streptomycin which was the first effective means of treating human tuberculosis. For this and other research, he received honorary degrees and medals, and was named an honorary member of scientific, dental and medical societies in Europe, Latin America and the United States. He was a recipient of France's highest award for services to humanity.)

Here's freedom to him who would read,
Here's freedom to him who would write.
There's none ever feared that the truth should be heard,
But they whom the truth would indict.
Robert Burns (1759-1796).

The importance of this book transcends fluoridation because it is concerned with science, values, ethics, integrity and professionalism. The book is also concerned with democracy; that is, with freedom of speech and a free press. The "fluorocracy", on the other hand, has too often engaged in censorship; opponents of fluoridation have been denied opportunities to speak at meetings and publish in professional journals. In a democracy, every individual should have the opportunity to publish what he wants, provided that he writes with propriety, pays whatever publication costs may be involved and assumes responsibility for what he has printed.

The fluoridation controversy is symptomatic of a deep-seated pathology in present-day science. The magnitude of that malady; that is, misconduct in research, which the public is well aware of, motivated the U.S. Academy of Sciences to convene a Panel on Scientific Responsibility and the Conduct of Research. (Responsible Science Ensuring the Integrity of the Research Process. Vol. I, Washington D.C.1992). The Panel's investigation, which cost $888,000, precluded consideration of certain kinds of scientific misconduct which specifically apply to fluoridation. Polluted science has occurred "when new scientific evidence threatens fluoride's protected pollutant status. The government immediately appoints a commission, typically composed of several veteran fluoride defenders and no opponents. Usually, these

commissions dismiss the new evidence and reaffirm the status quo. When one didn't in 1983, the government simply altered the findings." (Griffiths, J., 1992, Covert Action No, 42, page 26.)

The controversy about fluoridation was inevitable because fluoridation was, in a real sense, conceived in sin. Fluoride is a major waste product of industry and one of the most devastating pollutants of the aluminium industry. The government has not only dismissed the danger and left industry free to pollute, but it has promoted the intentional addition of fluoride - most of which is recycled industrial waste - to the nation's drinking water. Since 1950, when fluoridation was sanctioned, approximately 143,000 tons of fluoride are pumped into two-thirds of the reservoirs of the U.S. each year! (Griffiths, 1992).

One may also be interested in what I call "the pig mentality". In 1952, a U.S. Congressional Investigation concerned a recommendation by the U. S . Department of Agriculture that farmers not add to the water or feed of pregnant pigs because the fluoride did something to the unborn pigs. When one of the investigating committee asked whether "it might be wise for the U.S. Public Health Service or some group of people to enquire what might happen to pregnant women and the unborn child when they are given fluoride", the answer was, "There is more money available for matters that have economic value than there is for health." (Schatz,A. 1976 Cancer News Journal Vol. ll, No. 4.)

It is also important to understand how fluoridation was originally "sold" to the public. "The public relations strategist for the water fluoridation campaign was none other than Sigmund Freud's nephew, Edward L. Bernays ... known as " the father of public relations " Bernays pioneered the application of his uncle's theories to advertising and government propaganda. The government's fluoridation campaign was one of his most stunning and enduring successes ."..."Those who manipulate this unseen mechanism of society constitute the invisible government which is the true ruling power of our country - our minds are moulded, our tastes formed, our ideas suggested, largely by men we have never heard of." (Griffiths, 1992).

Now let us return to democracy to which this book on fluoridation makes a major contribution. "Knowledge will forever govern ignorance and a people who mean to be their own governors must arm themselves with the power which knowledge gives." (James Madison). This book gives us that kind of knowledge about fluoridation.

According to Sir Arthur Amies, "The passion to regulate the lives of others is deep-seated in many individuals. When this is based on political expediency, it is bad, and when it is inspired by an idealism which wishes to inflict benefits on others, it can be dangerous." (Schatz, A. 1976. Increased Death Rates in Chile Associated with Artificial Fluoridation of Drinking Water, with Implications for Other Countries. Anthony University Jour. of Arts. Science and Humanities. 2: 1. Copies of this publication may be obtained from the Library of Congress, Washington, D.C.) U.S. Supreme Court Justice Louis Brandeis expressed a similar concern as follows: "Experience should teach us to be most on our guard to protect liberty when the ... purposes are beneficial."

Philip R.N. Sutton's book presents and interprets the proverbial handwriting on the wall for fluoridation.

ABOUT THE AUTHOR

PHILIP R.N. SUTTON, D.D.Sc. (Melb) L.D.S., F.R.A.C.D.S. 1914 - 1995.

Dr Sutton wrote his first article pointing out errors in fluoridation trials, in the Medical Journal of Australia, thirty-five years ago. He continued to study and write about fluoridation, published numerous articles and two previous books on this subject.

In 1935, on his twenty-first birthday, he graduated with honours from the University of Melbourne, having completed the five-year course of the Bachelor of Dental Science. He immediately undertook post-graduate study and research in Physiology and Biochemistry and established a private practice in Brighton, Victoria which he conducted for twenty-five years.

On the outbreak of war in 1939 he enlisted in the Australian Army, serving in the Dental Corps for a total of five years. In North Borneo he was a member of an Australian Army medical team which saved British and Australian servicemen who had just been released from a small prisoner-of-war camp where they had been dying from starvation at the rate of six a day. Observations he made at that time formed the basis of a thesis submitted to the University of Melbourne which gained him the degree of Doctor of Dental Science - the highest dental research degree.

After the war he persuaded the Professor of Statistics at the University of Melbourne to establish a course, now called Statistics for Research Workers, and, having completed the course, joined the Statistical Society and was later elected chairman of the Biometric Society.

He was invited to become one of the Foundation Fellows to form the Royal Australasian College of Dental Surgeons. Dr Sutton was elected to the Council of the Victorian Branch of the Australian Dental Association (which appointed him as its representative on the Preventive Dentistry Committee which employed a public relations consultant to promote fluoridation, which had just been introduced into Australia. Therefore, because of that association, at that time he could have been said to be a promoter of fluoridation.

In 1956 he was appointed a Senior Research Fellow of the University of Melbourne and took his family for a year to Raratonga island, South Pacific, where he provided free dental treatment and studied tooth abnormalities in Polynesians which resulted from their diet and habits.

On his return to Melbourne in 1957, Professor Sir Arthur Amies, Dean of the Faculty of Dental Science, asked him to check the numerical data published from the original fluoridation trials and the scientific methods used in them. He discovered so many errors that to record them he was forced to write a 72-page monograph Fluoridation: Errors and Omissions in Experimental Trials (Melbourne University Press, 1959). He published a second 142-page edition in 1960 which answered the criticisms of the first edition, showing that they were false. This book remains scientifically unchallenged.

In 1964 Sir Arthur Amies invited him to become the first Senior Lecturer in Dental Science, a position from which he resigned eleven years later to have more time to continue his Pacific islands studies of Polynesians and Micronesians.

During a year's leave, in 1970-1971, he worked in London at the Maudsley Hospital for psychiatric patients, with the cooperation of Dr Denis Leigh the Secretary General of the World Psychiatric Association and Editor of the Journal of Psychosomatic Research. The aim was to extend his knowledge of the relation between mental stress and acute dental caries (which he had published in Nature in 1962; N.Y. State Dental Journal, 1965; Advances in Oral Biology, Vol. 2, 1966, Academic Press).

He published a second book Fluoridation, 1979: Scientific Criticisms and Fluoride Dangers as a 285-page submission to the Victorian Government-sponsored Committee of Inquiry into the Fluoridation of Victorian Water Supplies. This led to him being flown to Edinburgh to give evidence for several days before the inquiry into fluoridation in the High Court.

Dr Sutton had wide-ranging research interests and publications apart from fluoridation, such as his series of papers on the relation between mental stress and dental decay, the initial article being his first publication in Nature. He became a regular contributor to the "ideas" scientific journal Medical Hypotheses, which has published all the eleven papers he has submitted.

Philip Sutton was internationally respected as a dentist and medical researcher and a great gentleman.

Almost without exception, Philip Sutton is mentioned in the references of world publications on fluoridation.

Philip Sutton was noted as a strong fluoridation critic, but never once

stooped to personalities because of his strong conviction that honest science is where debate should be confined.

Philip, as he was affectionately known around Australia, was always available for discussions and advice on fluoridation and practical help in dentistry.

Philip Sutton published the first warning about fluoridation deceptive claims made about the first experimental fluoridation plants. His book Fluoridation: Errors and Omissions in Experimental Trials, published 1959 is only now acknowledged by the fluoridation hierarchy as correct, even though throughout the years since he published his research, the Health Departments of the U.S.A. and government employed dentists throughout the world aggressively attacked his printed data.

It is now documented in the Australian Government National Health and Medical Research Council 1991 Study into Fluoridation that:

"...The quality of the early intervention trials was generally poor."

So it took over 30 years before Philip Sutton's research data was acknowledged as correct by the Australian Government and other international organisations.

It would be difficult to find a more academically qualified and practical dental doctor with qualifications that set him above the so-called "experts" foolish enough to criticise his work.

Philip Sutton gave evidence at fluoridation enquiries around Australia, he also attended public meetings, often speaking on fluoridation. He always answered the questions that usually came fast and furiously.

The world has lost a great scientist, but he left a standard of quality research in his publications (including articles published in most countries of the world), and in his books, suggesting a standard that should continue to form the basis of proper debate on fluoridation.

To the end of his life Dr Sutton was a seeker of truth. Unfortunately he did not live to see this his final work published as he died on 12th March 1995.

CONTENTS

Before the first edition of that monograph ["Fluoridation: Errors and Omissions in Experimental Trials"] was published in 1959, as a matter of courtesy a copy of the final draft was sent, for his information, to the Federal President of the Australian Dental Association, Dr (later Sir Kenneth) Adamson - who was well known to me.

At Dr Adamson's request, the monograph was discussed with him for several hours in the presence of a friend of his, a consultant physician with extensive knowledge of academic statistics, who, to Dr Adamson's obvious surprise, did not make any criticism. This was not unexpected, for during its preparation it had been most carefully checked by Professor Maurice Betz, the head of the Department of Mathematical Statistics in the University of Melbourne.

Of course, the results published in the monograph threw considerable doubt on the pro-fluoridation stance which had been adopted by the executive of the Australian Dental Association. Therefore, having failed to find any errors in the monograph himself, Dr Adamson sought criticisms from others by sending copies of this final draft to a number of fluoridation "experts", including the authors of the five studies which were discussed in the monograph. Some of their replies to Dr Adamson were later published in the February, 1960, issue of the Australian Dental Journal as "Book Reviews". However, none of the published Criticisms were written by authors of the Grand Rapids and Newburgh studies. Upon inquiry, the Australian Dental Journal said that replies had been received from authors of those two studies, but that the language of their replies, particularly that of Dr David Ast of the Newburgh trial, was so immoderate that it had been considered unwise to publish their comments.

These criticisms of the monograph were backed up by an editorial in that issue which mentioned Part One of the first edition, which had been reprinted from an article by the present author, with Professor Sir Arthur Amies, in the Medical Journal of Australia, I February, 1958(a). That editorial in the Australian Dental Journal (1960) stated:

"It is important, however, not to be stampeded by this criticism [in the monograph] since to be of value it must have the hall-mark of informed authority."

That dental editor was so biased towards fluoridation that he was prepared

to brush aside the fact that Part One of the monograph, that article in the Medical Journal of Australia, had as co-author the "informed authority", Professor Sir Arthur Amies, Dean of the Faculty of Dental Science, University of Melbourne, who had closely studied fluoridation since its inception, and who had carefully considered the material in Part Two before it was published.

The editor of the Australian Dental Journal contended that this article (Sutton and Amies, 1958a) contained a "fundamental error", in that it stated that proposals to fluoridate domestic water supplies are almost entirely based on the results of the Brantford, Grand Rapids, Newburgh and Evanston projects. He claimed that the scientific basis of fluoridation was established firmly before those trials. However, he could not have read the reports of those four trials in which all the authors stated that their trials were set up to test the fluoridation hypothesis. For instance, the authors of the Grand Rapids study (Dean et al. 1950) stated:

"... in 1945, three studies to determine the caries prophylactic value of artificially fluoridated drinking water were started in the United States and Canada."

There would have been little point in establishing these long-term trials (planned to last for ten years) if the editor of the Australian Dental Journal had been correct, and the scientific basis of fluoridation had been established firmly prior to these trials.

Sadly, as the evidence against fluoridation has mounted over the years, the executive officers of the Australian Dental Association, instead of reassessing their stance, have become more and more dogmatic in their statements regarding this process. This attitude has jeopardized the status of dentistry as a scientific discipline which maintains an open mind, so that opinions can be modified as new scientific facts emerge which show that the views held are no longer tenable.

It should be known that there is no evidence that the great mass of dentists in private practice have studied fluoridation data. As in the case of most scientific matters, which they have neither the time nor the specialized training to investigate, their opinions are based on those expressed by the executive officers of the Association who, they assume, provide them with a well informed and honest appraisal of scientific subjects. Unfortunately that assumption, in the case of fluoridation, is not justified.

The same situation occurs in other countries. The President of the International Society for Research on Nutrition and Vital Substances, Professor H.A. Schweigart, pointed out in 1967 that the German organization of dentists had requested the fluoridation of drinking-water on behalf of its 35,000 members, but that most of the members were not consulted. He stated:

> "The fluoridation of drinking-water releases a fluorine circuit which includes vegetables, fruit and other horticultural products as well as milk, and has an uncontrollable effect on the human organism."

At least some executive officers of the A.D.A. have promoted fluoridation for many years, saying that it is efficacious and absolutely safe. It seems they are now so afraid of losing "face" that they are prepared to make false statements and to mislead even their own members about this medication. Such an incident occurred in an anonymous newsletter distributed to all the members of the Australian Dental Association in 1989. This bulletin was entitled "Disaster in Canberra". No mention was made of the dental effects of this "disaster"—the cessation of fluoridation in Canberra by order of the A.C.T. Legislative Assembly. The "disaster" seems to be the fact that that decision was contrary to the policy of the executive officers, and to the advice they had given during "... a vigorous lobbying campaign to inform members of the Assembly of the Association's views on fluoridation" and, therefore, was damaging to their prestige and image. The newsletter said that another study which purported to reach the same conclusion as Dr Diesendorf's [which the newsletter criticized] was by Colquhoun in New Zealand. The newsletter stated:

> "When the data was re-examined for previous fluoride exposure by the N.Z. Medical Research Council Colquhoun's "findings" evaporated."

This statement in the ADA News Bulletin is false. The Director of the Medical Research Council of New Zealand stated in a letter, dated 8 January, 1990, to Dr John Colquhoun, that:

> "... this Council has not at any stage set out to re-analyse your research data, nor has it contracted others to do so."

In reply to a request by the present author for a copy of their "analysis" cited by the Executive of the A.D.A., the Administrative Officer of the New Zealand Medical Research Council, in a letter dated 7 February, 1990, stated (in part):

> "Neither this Council nor any of its research Units or investigators have produced a paper on this work [by Dr Colquhoun] nor am I aware of the possible source of this information."

These two letters show that the statement by the Executive of the A.D.A. is not true.

A similar statement to that in the ADA News Bulletin was incorporated into a long (10-page) misleading letter to members of the ACT Legislative Assembly and was a factor in tricking some of them into reversing their vote and restoring fluoridation to Canberra, without waiting for the finding of a five-member Parliamentary Committee which the Assembly had set up to investigate this matter. The report of this committee was published in February 1991 (See Appendix II).

The concept of fluoridation arose from the results reported from "naturally fluoridated" areas of the U.S.A., during investigations into the cause of the unsightly condition then called "mottling" of the teeth ("dental fluorosis"). The main investigator was Dr Trendley Dean (1934), who became known as "the Father of Fluoridation".

In 1983, Dr Rudolph Ziegelbecker, of the Institute of Environmental Research, Graz, Austria, commented on these studies. One of them showed that with a fluoride concentration of 0.5 ppm in Wisconsin the DMF rate per 100 children aged 12-14 years, was 710 - twice that of the DMF rate (342) in children of the same age in Colorado, where the fluoride concentration in the drinking-water was also 0.5 ppm. He found that:

> "The calculation shows that in Wisconsin, fluoride in the range from 0.12 to 0.5 ppm was not correlated with caries incidence", and he stated that "This study by Dean, used by the respondents [in a High Court case in Edinburgh] to support the hypothesis that fluoride reduces the caries incidence, is clearly unsound in its premises and conclusions and gives no one evidence that fluoride reduces caries incidence."

Ziegelbecker also considered the famous diagram showing the dental caries / fluoride relationship in 21 cities in the U.S.A. This was prepared by Dean, Arnold and Elvove in 1942 and was published in many text-books, having a marked influence in promoting the idea that the prevalence of dental caries was inversely related to the fluoride content of drinking-water.

Ziegelbecker (1983) stated that this chart of the "inverse relationship" between fluoride ingestion and dental caries prevalence was based on:

> "... an inexcusable illicit selection of data"

because dental surveys from more than 650 counties and cities were known to Dean, but that he had:

> "...selected 21 cities in such a manner that the result supported the thesis of the "inverse relationship" between the natural fluoride content of the common water supply and the caries incidence in children."

(More than forty years after its publication this false diagram was still used, being tendered in evidence in 1981 by the pro-fluoridation respondents in that High Court case in Edinburgh, who stated that it was a careful and important study.)

Contrary to the contention of the editor of the Australian Dental Journal, there is no doubt that the early results reported from the Grand Rapids trial brought about the endorsement of fluoridation by the U.S. Public Health Service in 1950 (Lohr and Love, 1954), and undoubtedly formed the basis of later proposals to fluoridate drinking-water.

The editor of the Australian Dental Journal did not make further comments on that paper (Sutton and Amies, 1958a) after Associate-Professor Noel Martin, the main advocate of fluoridation in Australia, had failed, in two long letters to the Medical Journal of Australia on 22 February and 14 June 1958 (Martin, 1958a, 1958b) to point out any errors in the paper.

In a reply to Martin's letters it was noted (Sutton and Amies, 1958b) that:

> "Despite the fact that the length of his [Martin's] criticisms considerably exceeded that of the paper, he did not indicate even one error in the statements made in demonstrating that there are disturbing features in the published reports of fluoridation trials."

The same Associate-Professor Martin was appointed on 12 November, 1959 by the Dental Advisory Committee of the National Health and Medical Research Council of Australia to be the chairman of a committee of three—the other two members were professors of statistics—to investigate the contents of the monograph *Fluoridation Errors and Omissions in Experimental Trials*. Apparently, even with their expert assistance, he was not able to criticize the book and hoped that the matter would be forgotten, for more than three years later his report had not been submitted. However, this was noticed, and he was then instructed (25 March, 1963) to present it at the next meeting of that Committee of the NH&MRC. He did so, but his

report was not released.

After the passing of the Freedom of Information Act, under the provisions of that Act, the chairman of the Anti-Fluoridation Association of Victoria sought for two years to see that report by Associate-Professor Martin. When the report was not forthcoming the matter was taken to the Administrative Appeals Tribunal (in effect, a court) in July 1985, the respondent being the Secretary of the Commonwealth Health Department. After a lengthy case in the Tribunal it was announced that although the other records of the NH&MRC were available, Associate-Professor Martin's report could not be found, and that no further search would be undertaken by the government to locate this official report by Martin and his committee.

(There is no doubt that this report existed at one time for Sir Arthur Amies, who was then a member of the Dental Advisory Committee of the NH&MRC, told the present author that he had read it, but that it was merely fluoridation propaganda and had not provided any valid criticism of the monograph. Presumably it had been removed from the NH&MRC files and destroyed.)

Soon after the first edition of the monograph was published, the stored printer's type at the Melbourne University Press (which was usually held for at least six months) was melted down without authority by an unknown person, thus almost preventing the publication of a second edition. However, the type was re-set, at considerable expense...

There are accounts of similar attempts being made in other countries to prevent the publication of books which criticize fluoridation. One well-known case was the book The Toxicology of Fluoride, edited by Professor T. Gordonoff. According to Professor Albert Schatz (1965), one publishing house set the type:

> "But it was then warned that if it went ahead and published this particular book the dental community would stop patronizing it. In the face of this threatened economic boycott and enticed by an offer of compensation to cover all expenses incurred (approximately 10,000 Swiss franks), the publisher "dropped" the book."

It was published two years later by Schwab & Co.

As Schatz said in 1965:

> "There are powerful forces which now have a vested interest in perpetuating fluoridation because their reputations depend on its

continuation."

Suppression of discussion regarding fluoridation

The same vested interests are promoting fluoridation today, in the 1990's using similar techniques to prevent the spread of the knowledge that fluoridation has failed: The repression and abuse of opponents of this process and the suppression of published evidence against it, and making it difficult to publish new material which those interests consider even questions fluoridation.

This discouragement of the discussion on fluoridation is still pursued very actively. The U.S. Public Health Service (U.S.PH.S.) - now the Department of Health and Welfare - distributes enormous funds to its many agencies. It also finances many research grants, both in the U.S.A. and in other countries. This control of grants has a restricting effect on the scientific discussion of fluoridation, for since 1950 it has been a process strongly promoted by the U.S.PH.S. American professors have admitted that they have to think of their grants and, therefore, avoid the subject of fluoridation. This is understandable for, apart from the financial aspects, if they questioned fluoridation there would be a distinct possibility that they would be added to those who are abused and whose personal reputations are attacked.

The refusal to consider any material which questions fluoridation is well illustrated by the experience of Professor Albert Schatz. In 1976 he published reproductions of photostat copies of three envelopes he had used in 1965, each containing the same short article about increased death rates associated with fluoridation in Chile. He had written previously to L.C. Henderson, the editor of the Journal of the American Dental Association about this paper but had not received a reply. The photographs show that the editor had refused to accept each of the three envelopes, in succession, and that they had therefore been returned, unopened, to Professor Schatz (his name was on the outside of each envelope).

In 1961, the American Dental Association's Bureau of Public Information, in a re-issue of a publication entitled Comments on the Opponents of Fluoridation, grouped several reputable scientists with alleged members of the John Birch Society, the Ku Klux Klan, an escapee from a hospital for mental patients, and others, in an obvious attempt to injure their reputations by "damning by association." That dossier condemned the 300 members of

the Medical-Dental Committee on the Evaluation of Fluoridation, solely because they were such a small proportion of the 300,000 physicians and dentists in the U.S.A.

Mr Ralph Nader, the consumer advocate, said in 1971:

> "... you just don't expect to be treated well by H.E.W. [a branch of the U.S.PH.S.] in its massive research granting if you come out against this kind of thing [fluoridation]. It's a matter of professional intimidation here."

In 1988 Bette Hileman, an associate editor of Chemical & Engineering News, stated that John S. Small, information specialist at the U.S. National Institute of Dental Research, had admitted that he keeps files on anti-fluoridation organizations and their leaders, and she said that Ralph Nader had branded such activities as an "institutionalized witch-hunt".

An attempt was made to prevent the distribution of the monograph Fluoridation: Errors and Omissions in Experimental Trials (Sutton, 1959) in the U.S.A. by, amongst others, the Nutrition Foundation Inc., which wrote to the distributors, Cambridge University Press, New York, on 20 January, 1960, declaring that:

> "The professional standing of the Cambridge University Press among scientists and educators would seem to preclude publication of such a book by Cambridge University Press."

In his reply (25 Jan., 1960) the manager of the Cambridge University Press said;

> "... if you find inaccuracies in Dr Sutton's book, we should be most grateful if you will point them out to enable us to make changes in any future printing."

He did not receive a reply to his letter.

When this attempt to suppress the monograph failed, the Journal of the American Dental Association published an extensive criticism of it. That influential journal, in July 1960, devoted a three-page editorial to attacking the monograph. It stated:

> "Last year the Melbourne University Press of Australia published an 83 page booklet by Mr P.R.N. Sutton entitled Fluoridation Errors and Omissions in Experimental Trials. It is now being circulated to a limited extent in the United States.

> The following review prepared by J. Ferris Fuller for the New Zealand Dental Journal is herewith republished in full as it skillfully points out many of the errors and omissions in reporting which Mr P.R.N. Sutton has less skilfully employed in compiling his observations on the errors and omissions in fluoridation."

By twice incorrectly using the term "Mr ", the editor of the J.A.D.A. conveyed to readers, particularly to American ones, that the author of the monograph was a layman, for all dentists and medical practitioners in America are given the title of "Dr" If the editor of J.A.D.A. had read even the title page of the monograph he must have known that the author had received the postgraduate degree of Doctor of Dental Science from the University of Melbourne. Therefore it appears that this "mistake" was made deliberately to deceive his readers.

Then followed the criticism by J. Ferris Fuller shown on pages ***327 to 330.

However, the editor of the Journal of the American Dental Association was so keen to denigrate the monograph that he failed to check the claims made in the "book review" which he re-published. Apparently he did not realize that the criticism by Colonel Fuller, although superficially "skillful", was based on misquotations—that this critic condemned statements which the author of the monograph had not made, nor did he realize that Colonel Fuller had concocted many false and misleading comments of his own.

The most important publication which enables a reader to locate articles and books on dental subjects is the annual Index to Dental Literature published by the American Dental Association. This lists not only all articles and letters, but also all books and pamphlets published during the year, and has the reputation for being a comprehensive list. The Indexes for the years 1960 and 196 1, which should have listed the first and second editions of the monograph did not do so, nor did they mention the favourable reviews.

However, they indexed the unfavourable ones, so that these omissions were obviously made intentionally by staff of the American Dental Association to suppress this criticism of fluoridation trials, which were the foundation for the endorsement of this process by that Association.

The following pages are a reprint of the second edition of that monograph: Fluoridation: Errors and Omissions in Experimental Trials, 1960, Melbourne University Press, which has been out of print for many years.

PART ONE

SOME STATISTICAL OBSERVATIONS ON FLUORIDATION TRIALS*

The suggestion that domestic water supplies should be-fluoridated, with the aim of partially preventing the development of dental caries, has gained wide support, and moves are being made in Australia for the widespread introduction of this measure. Much confusion of thought clouds the issue of the desirability, the method of action and the safety of this process. This uncertainty is reflected in two recent events. In November 1956, a Reference Committee of the American Medical Association (1957) stated that "there is a definite need for a re-evaluation of the problem of fluoridation",† and in March 1957, after a public hearing, the proposal to fluoridate the water supply of New York was not put into practice (Nesin, B.C., personal communication, 1957).

Apart from these considerations, an examination reveals that there are aspects that call for a very careful appraisal of the figures presented in the reports of the experimental trials which have been conducted in Brantford, Canada, and in Grand Rapids, Newburgh and Evanston, U.S.A., and upon the results of which proposals to fluoridate domestic water are almost entirely based.

A preliminary survey of the methods used, of the published figures and of the method of their presentation discloses some disturbing facts. Some of these are as follows. (i) In the clinical examinations no attempt was made to devise a randomization procedure, which would have eliminated bias on the part of the examiners. However, the necessity for such a precaution was recognized by Ast, Bushel, Wachs and Chase (1955) in the Newburgh-

* Reprinted from a paper by Philip R. N. Sutton. D.D.Sc. (Melb.), L.D.S. (Vic.) and Arthur B. P Amies, C.M.G., D.D.Sc. (Melb.), F.R.C.S. (Edin.), F.R.A.C.S., originally published in the Medical Journal of Australia, 1 February 1958.

† In December 1957, the American Medical Association endorsed the principle of fluoridation, but that decision cannot affect the facts which have been stated in this paper.

Kingston trial, when they instituted a combined clinical and X-ray study eight years after the commencement of the ten-year investigation. (ii) No estimate was made of variability between examiners, although in some studies several operators were employed, some being changed from year to year (Blayney and Tucker, 1948; Arnold, Dean and Knutson, 1953); some of the examinations in Kingston were made by two dental hygienists (Ast, Finn and McCaffrey, 1950). Furthermore, there appears to be no estimate of variability within the examiner-that is, the variability of individual examiners from inspection to inspection. (iii) The importance of random variation in the DMF rate (decayed-missing-filled permanent teeth rate) does not appear to have been recognized, or else it has been ignored. (iv) Bias is suggested by the presentation of some results, so that the casual reader may be misled (Ontario Department of Health, 1956).

The following observations will serve as illustrations.

1. In each of these studies it has been emphasized that the maximum benefits of fluoridated water are seen only in those subjects who have consumed it during the total period of enamel formation. Therefore, it would be expected that only a slight decrease (due to the possible topical effect of the fluorine) would be seen in the DMF rate between successive years during approximately the first six years of the project, until the first permanent teeth which had been completely formed under its influence had erupted, and that the advent of these "resistant" teeth would thereafter produce a greater drop in DMF rate between succeeding years. However, in the first three years of each project there is a marked relative fall in the reported DMF rate, particularly in the younger age groups; while in the six years-old group in Brantford the rate reached after ten years is no lower than it was after only four years of fluoridation, (Ontario Department of Health, 1956; Hutton, Linscott and Williams, 1956). It would appear that the results reported are not those which would be expected if the theory mentioned above is correct.

2. In four of these studies (Hutton et al., 1956; Hill, Blayney and Wolf, 1956; Arnold, Dean and Knutson, 1953; Ontario Department of Health, 1956) the method of expressing changes in caries experience was the same. The final rate was subtracted from the baseline rate, and the difference was expressed as a percentage of the latter rate. It is obvious, therefore, that with

this method, relatively small variations in the baseline values will produce substantial alterations in the percentage reduction obtained. For instance, in the seven-year-old children in Evanston, during the last five years reported, the increase in caries immune deciduous dentitions was 361 per cent, but for the whole of the nine-year period 1946-55 the increase was only 58 per cent "Hill et al., 1956). The authors claim that "difference between 1946 and 1955 rates is statistically significant" However, such a claim is not warranted, owing to the marked variation in the values observed in the intervening years. The effect of variations between years is seen in the six-yearold group in Brantford. By the use of this method of calculation the reduction in the DMF rate for the period 1944-50 was 82 per cent, but the apparent benefit had dropped to 52 per cent, a decrease of 30 per cent, after an additional two years fluoridation (Ontario Department of Health, 1956). An improved method of indicating relative changes in the DMF rate would seem to be desirable - in particular, one which would permit statistical tests to be applied.

3. As an instance of the divergent results which can be reported by different examiners, those from the two independent trials in Brantford may be compared (Ontario Department of Health, 1956). The National Health and Welfare authors reported a reduction in the DMF rate in the six to eight years age group of 69 per cent from the inception of their examinations in 1948 to the 1954 results. However, in the same city, in the same age range and between the same years, the reduction in the DMF rate obtained by the City Health Department examiner was only 25 per cent, less than half of that claimed by the authors of the other study. The Health Department DMF figures for 1954 were given for individual age groups without statement of the number of children involved in each group. The 25 per cent reduction is based on a DMF rate obtained by simple averaging of the six, seven and eight year DMF rates. For 1948 the actual numbers of children are available (Hutton, Linscott and Williams, 1951). The uncertainty in the computed reduction of 25 per cent is most unlikely to account for the gross difference between it and the figure of 69 per cent quoted by the National Health and Welfare authors.

4. In Table II of the Report of the Ontario Department of Health (1956) to the Ontario Minister of Health, the mean numbers of decayed or filled

deciduous teeth are shown. In the column headed "% Reduction Since 1948", there are dashes Opposite the control cities of Sarnia and Stratford. These, surely, would lead the reader to suppose that no reductions had taken place in these cities, particularly as the footnote states that "the rates for Stratford, which has had natural fluoridation for 30 years, and Sarnia, which has no fluoride in its water, have remained about the same". However, in the nine to eleven years age group in Stratford there was a slight decrease of 5 per cent (by the use of the DMF rate reduction method common in these studies), and in Sarnia the same age group showed a decrease of no less than 16 per cent. One would like to know the reason for the omission of these figures, particularly as the latter reduction is almost as high as the 18 per cent claimed for children of the same age in the test city.

Whilst we do not question the integrity of workers in this field, it must be pointed out that the evidence tendered in favour of fluoridation reveals two disturbing features. The first is that what must be essentially a statistical study does not appear to have been planned as such. The second is that even when sufficient information is presented, no comprehensive attempt at statistical evaluation has been considered.

It is possible that a case for fluoridation can be solidly based, but until adequate statistical treatment of all the pertinent factors has been carried out and this would be quite a major undertaking the question should not be regarded as settled. In the meantime, claims concerning the amount of caries reduction are open to doubt.

PART TWO

FLUORIDATION TRIAL CONTROLS: ERRORS, OMISSIONS AND MIS-STATEMENTS

INTRODUCTION

The fluoridation trials that were conducted in the cities of Grand Rapids, Newburgh and Evanston, in the U.S.A., and the two independent ones in Brantford, Canada, are of more than ordinary importance, because they constitute the main experimental evidence which has led to the introduction of this process as a public health measure. The fluoridation hypothesis is "that a concentration of about I part per million of fluoride in the drinking water, mechanically added, inhibits the development of dental caries in the teeth of the users of the water" (Brown, McLaren and Stewart, 1954b). In 1956 Nesin pointed out: "It must be emphasized that the fluoridation hypothesis in its entirety rests on a very narrow base of selected experimental information. It is this very base which is vulnerable to scientific criticism. And, it is upon this very narrow base that the very impressive array of endorsement rests like an inverted pyramid."

The safety of artificial fluoridation has been questioned by a number of eminent authorities such as Hicks (1956) and Sinclair and Wilson (1955). In 1955 Box stated: "It is my considered opinion that the artificial fluoridation of water supplies, on a wholesale basis, should not be advocated or adopted until fully sufficient findings show that there are no harmful sequelae from a gingival or periodontal standpoint."

However, these questions need be considered only if the overall dental benefits of fluoridation are demonstrated beyond reasonable doubt, and are also found to be worthwhile from a socio-economic point of view. No suggestion has been made that fluoridation has other than dental benefits.

It has been widely accepted that the existence of marked dental benefits has been established, and the literature abounds with references to reductions of about 60 per cent in dental caries as a result of fluoridation. However, the

published works contain little consideration of the numerical data reported from these trials, as distinct from mere statements of percentage reductions in the caries attack rates.

A preliminary examination revealed that reports of these studies contain errors and show omissions, and statements made in regard to results are not justified by published data; therefore further study has been made of these crucial trials. This study attempts to evaluate their controls, and the discussion is limited to examination of published reports of (i) method of selection of control cities; (ii) their suitability; (iii) the experimental and statistical processes used in gathering and analysing the data (iv) the results stating the dental caries attack rates; (v) some comments made by the authors of these trials (and by others) on these results.

The aim will be to investigate the reliability of the results reported, to assess the adequacy of the controls that were set up and to evaluate the accuracy of the statements made concerning the data obtained.

BASIC CONSIDERATIONS

Before discussing the procedure adopted in each of these studies, several basic matters that are of importance in a fluoridation trial will be considered.

The necessity for controls. Blayney and Tucker (1948) were correct in stating that "A study of this nature must have an adequate control." The necessity for such a procedure was recognized by the authors of four out of five of these studies. Cities with "fluoride-free" water supplies were selected as controls, and comparisons were made with towns which possessed water supplies with a fluoride content obtained from natural sources, which approximated the concentration which has been called the "optimum" one (Dean, Arnold, Jay and Knutson, 1950; Brown, 1951; Ast and Chase, 1953; Hill, et al., 195 1). It is to be noted that in the trial conducted in Brantford by the City Health Department (Hutton et al., 1951) no provision for controls was made.

Requirements of a control. In an experiment such as the fluoridation of the water supply of a city, whereby the whole of its population is subjected to treatment (fluoridation), it is necessary to obtain the control data from subjects who live in a city or cities with "fluoride-free" water supplies. In determining the cities which are to participate in the trial, in order to increase the sensitiveness of the experiment, it is advantageous to employ ones which are alike in as many respects as it is practically convenient to consider. Of course, as Fisher (1951) pointed out, "the uncontrolled causes which may influence the result are always strictly innumerable."

Because of the nature of these experiments, three main points of similarity must be considered and described. These are (a) the water supply; (b) the climate; and (c) the dental caries attack rates. Other factors, such as socioeconomic status, are of less importance; their influence may be reflected in the caries attack rates.

(a) In its statement of its official policy on this matter, the American Water Works Association (1949) said that the experimental verification of the fluoride-dental caries hypothesis "obviously necessitates the use of a nearby "control" city with a water supply comparable in all respects to that to which fluoride is being added." The Association referred to "the possible

influence, on the fluoride potency, of other chemical constituents of natural waters, insofar as these and other variables may affect the action of fluoride on the control of caries in a human population." In 1942 Deatherage reported that "It is these soft waters which cause the most severe mottled enamel." Therefore, the fact that both the test and the control city in a fluoridation trial obtain their water from the same source does not remove the necessity for a study of the composition of the water. Dean, Jay, Arnold, McClure and Elvove (1939) recognized this, stating, "the possibility that the composition of the water in other respects may also be a factor should not be overlooked. For this reason it seems highly desirable that dental caries studies should be accompanied by complete chemical analyses of the dam waters, including a search for the comparatively rare elements." However, in none of these trials was the composition of the water stated.

(b) The climate of a city is an important factor in determining the average amount of salts ingested from the water supply, because of its influence on the volume of water consumed by humans. Therefore, cities that are to be compared should not only have water supplies that have a closely comparable composition, but the climates of the cities should also be very similar.

(c) As the main aim of fluoridation is to reduce the dental caries attack rates, it is obviously of importance that the cities to be compared should have closely comparable dental caries rates within yearly age groups, of children. This information can be obtained only by conducting at least one survey in the cities that are suitable for comparison on other grounds, so that the fact that the caries attacks rates are similar is established prior to the fluoridation of the water supply of one of them.

Random sampling. The fundamental importance of random sampling has been acknowledged for many years. In designing an experiment, as Quenouille (1952) said, "it is necessary to allot the treatments to the available material at random if unbiased estimates of both the effect of the treatments and also the reproducibility of the effects are to be obtained." Therefore, a random device should be employed to determine which of the participating cities is to be the test one.

Variation. Fisher (1950) emphasized this important matter when he said that "from the modem point of view, the study of the causes of variation of any variable phenomenon, from the yield of wheat to the intellect of man, should be begun by the examination and measurement of the variation

which presents itself." As was pointed out by Hill et al. in 1950: "It is to be expected that the rate of caries in all teeth varies from year to year due to chance." Therefore, a basic requirement of a fluoridation study is the assessment of the variability of the caries attack rates.

Examiner variability. In experiments in which, of necessity, the subjective judgment of examiners is employed, an important consideration is the assessment of "between-examiner" and "within-examiner" variability. The former type of variability is disclosed when different examiners observe the same subjects, and the latter type is seen in the different results reported by the same examiner inspecting the same subjects on different occasions, but which are sufficiently close together to ensure that the dental condition has not undergone appreciable change.

The important effect which examiner variability can have on the results of a study of dental caries attack rates was pointed out by Radusch (1941) and by Dunning (1950). A recent example is seen in the paper of McCauley and Frazier (1957). Their Table I shows that in the examinations made by one examiner in 1955 of Negro boys and girls who were six years old, in both sexes the DMF rate per 100 teeth erupted, and also the DMF rate per child, were found to be about four times as great as those reported for the same age groups in 1952 when they were examined by several examiners. The authors considered that "it is entirely possible that the 1952 findings were influenced by a bias stemming from subjective differences in the appraisal of tooth decay by different dentists". Between-examiner variability of such a magnitude can, of course, vitiate the results of a study. Unless the examiner variability is determined, and is taken into account, the conclusions drawn from a study of caries attack rates must be treated with reserve.

Examiner bias. In designing an experiment of this nature, one aim should be to eliminate examiner bias. This may arise if the examiners know whether the children they are examining belong to the test or to the control city. One method of doing this is to transport to a common examination centre the small number of children, some from the test and some from the control city, that can be examined each day; the examinations being conducted in a random order which is unknown to the examiners. It is not suggested that in the absence of such precautions the examiners exhibited intentional bias; indeed, as Armitage (1954) pointed out, "through fear of being biased" the judgment of an examiner may be influenced.

THE GRAND RAPIDS STUDY

The city selected as the "fluoride-free" city for comparison with Grand Rapids was Muskegon, Michigan, "whose source of drinking water supply and geographical and climatological characteristics were similar to those of Grand Rapids" (Dean et al. 1950). This city was the only control one in which the caries attack rates in each year were published for each yearly age group. Unfortunately, its usefulness was marred by a number of features.

Large differences in sample size. The reliability of a mean rate is greatly influenced by the number of observations on which it is based. Because of the small number of subjects included in some age groups in some years in Muskegon, little reliance can be placed on the values stated. In twelve categories fewer than twenty children were examined. One "group" consisted of only one child, whereas one contained 462 children (Arnold et al., 1953). In the test city the variation in sample size was even greater, from 18,606 to 3 subjects.

Sampling by school class. "selected age groups of children are examined within each of the schools. Selection is made on the basis of school grade or class, using all children present in a class or grade of a school." (Arnold et al. 1953). These grades or classes were examined in 1945, an additional grade being examined in 1946, 1947 and 1949, and two more in 1950, making a total of eight grades in 1950 and 1951. In the last mentioned year Muskegon ceased to act as a control.

Different methods of sampling. In Grand Rapids the "annual study sample was selected after careful review of census data and consultation with city planning department officials. On the basis of available information, the 31 school districts of Grand Rapids were classified on a socio-economic basis. From the 79 schools in these districts, 25 representative schools were selected, and the examiners were assigned schools on a basis of equal sized samples of comparable population groups" (Arnold, et al., 1953). However, that strange procedure was not followed in Muskegon, the same authors stating that "In Muskegon, the annual examinations have been conducted in almost all schools, excluding only a few small schools on the periphery of the city where many students are from rural areas."

Changes in examiners. In the report of this study up to and including 1951

(in July 1951 Muskegon ceased to be a control), it was stated: "There have been changes in dental examiners with the exception of one officer who has participated in each series of examinations. Each new examiner has been calibrated against this one officer to standardize diagnostic criteria" (Arnold et al., 1953). The degree of success of this odd calibration procedure was not stated.

Examiner variability not assessed. In 1953 Arnold et al said that "Bite-wing X-ray examinations were made of a representative sample of children examined by the different examiners to evaluate, in part, the "examiner error"." However, such a procedure cannot replace the data that could have been obtained by a correctly designed examination process, which would have enabled the determination of between-examiner and within-examiner variability.

Late examination of control city. The authors of this study did not determine the caries attack rates in children in Muskegon prior to accepting this city as a suitable control, for comparison of two of their statements makes it clear that the results of the basic examination in the control city were not known until after the water of the test city was fluoridated. They stated that "Fluoridation of the Grand Rapids water supply was started January 25, 1945" (Dean et al., 1950), and that the "basic examinations in Muskegon were not done until late spring of 1945" (Arnold et al., 1953).

Water of control fluoridated. Another fact which limits the usefulness of Muskegon as a control city is that its water supply was fluoridated in July 1951 (Arnold et al., 1953), so that the results obtained after that date had no value as controls for those of Grand Rapids. This event occurred six and a half years after the institution of fluoridation in Grand Rapids, and therefore at a time when, in the latter city, few of the permanent teeth had erupted in the children that had been ingesting fluoridated water since birth.

Ignorance of commencement of fluoridation in control city. The fact that Muskegon had ceased to be a control by having its water fluoridated in July 1951 was not always realized. For instance, Black (1955) in a paper "Presented before Section on Public Health Dentistry, ninety-fifth annual session, American Dental Association, Miami, Fla., November 8, 1954" - over three years after the institution of fluoridation in Muskegon (Arnold et al. 1953) - said that "At Muskegon, Mich, the control city where fluoride-free water is used, the incidence of dental caries is unchanged and approximates

the norm." Black was commenting on the findings made "After eight years of fluoridation at Grand Rapids" (that is eighteen months after the fluoridation of the Muskegon water). No information has been found in the literature with regard to the "national norm", in fact a feature of these trials has been the divergent pre-fluoridation rates. The differing caries attack rates seen in different localities, even in the same state, were illustrated by Hagan (1947) and by Hadjimarkos and Storvick (1949, 1950).

A similar statement to that of Black (1955) was made by Martin (1956) in a lecture delivered at the fourteenth Congress, Australian Dental Association, Melbourne, March 1956; that is, over four and a half years after the Muskegon water was fluoridated. He said: "The decay rates in the fluoride free control area (Muskegon) have remained unchanged." The paragraph containing the above-mentioned quotation cites as reference Arnold et al. (1953), who in that paper said: "The water supply at Muskegon remained unchanged until July 1951, when the city started adding fluorides to its water supply."

Variations in Muskegon rates. Tables 3 and 4 of the report of the seventh year of the Grand Rapids study (Arnold et al., 1953) show that both the def (decayed, extraction indicated, or filled deciduous teeth) and the DMF rates reported from Muskegon from year to year differed considerably from those of the first examination. Despite this fact, the statement that the incidence of dental caries in Muskegon was unchanged was made by Black (1955) and Martin (1956), amongst others. These statements are at variance with that of the authors of the study (Arnold et al., 1953), for they mentioned the changes in these words: "A similar comparison of results at Muskegon shows the percentage reduction to range from 1.5 percent in 6-year olds to a high of 15.5 percent in the 11 year olds" in the permanent teeth.

The magnitude of the changes. The statement which has been quoted above does not reveal the magnitude of the changes which were observed in the DMF rates in the control city. The percentage reductions given were obtained by the method commonly used in all these studies, that is, the difference between the most recent and the original DMF rate was expressed as a percentage of the original rate, the variations obtained in the intervening years being ignored. The changes which occurred would have been more obvious if, for instance, the results for Muskegon had been computed in 1946 instead of in 1951. In that case the "reduction" would have been 40.7 per cent instead of 1.5 per cent in the six-year old, and 32.7 per cent instead of 15.5 per cent in the eleven-year-old children.

Sampling error. Arnold et al. (1953) stated that the percentage reductions obtained in Muskegon "may, in part, represent sampling error." It was not conceded that such an error could also apply to the results from the test city, nor were suggestions made as to the cause of the remainder of the reductions in the control city. These cannot be attributed to changes in the water supply, for they stated: "The water supply at Muskegon remained unchanged until July 1951, when this city started adding fluorides to its water supply" (Arnold et al., 1953).

Variation in Muskegon. The variability from year to year in the mean rates reported from Muskegon, which, it will be recalled, were stated to have remained unchanged (Black, 1955; Martin, 1956) are illustrated in Figs. 1 and 2. The data from which these figures were drawn are from Tables 2 and 3 (with errata corrected) of Arnold, Dean, Jay and Knutson (1956). The point shown in Fig. 2 for the sixteen year-old children in 1946 should be disregarded, as this age "group" consisted of only one child.

Comparison of the series of baseline rates for DMF in Grand Rapids and in Muskegon does not reveal that one series was consistently higher than the other. However, with the exception of the eleven and twelve-year old children, the def rates in Muskegon were higher than they were in the test city.

Comparison with Aurora. Arnold et al. (1953) said: "To establish what might be termed an "expectancy curve" for this study, a natural fluoride area, the city of Aurora, Ill., was selected. The Aurora water supply contains 1.2 ppm F and has a reliable "history of constancy back to 1895." It was not stated whether factors other than the fluoride content of the water supply were considered in selecting this city. The fact that other influences can be of importance was shown in the recent study by Russell (1956) in Montgomery-Prince Georges counties. Prior to the institution of fluoridation, in the total sample of subjects the def rates for children whose mean ages were 5.44, 6.47, 7.45 and 8.49 years were lower than those of children of similar ages in Aurora.

Limitations of Aurora data. The caries attack rates reported from Aurora consist of a single series obtained by several examiners in 1945-6. Therefore, there is no information with regard to variations from year to year in the mean value of the rates, and examiner variability was not considered.

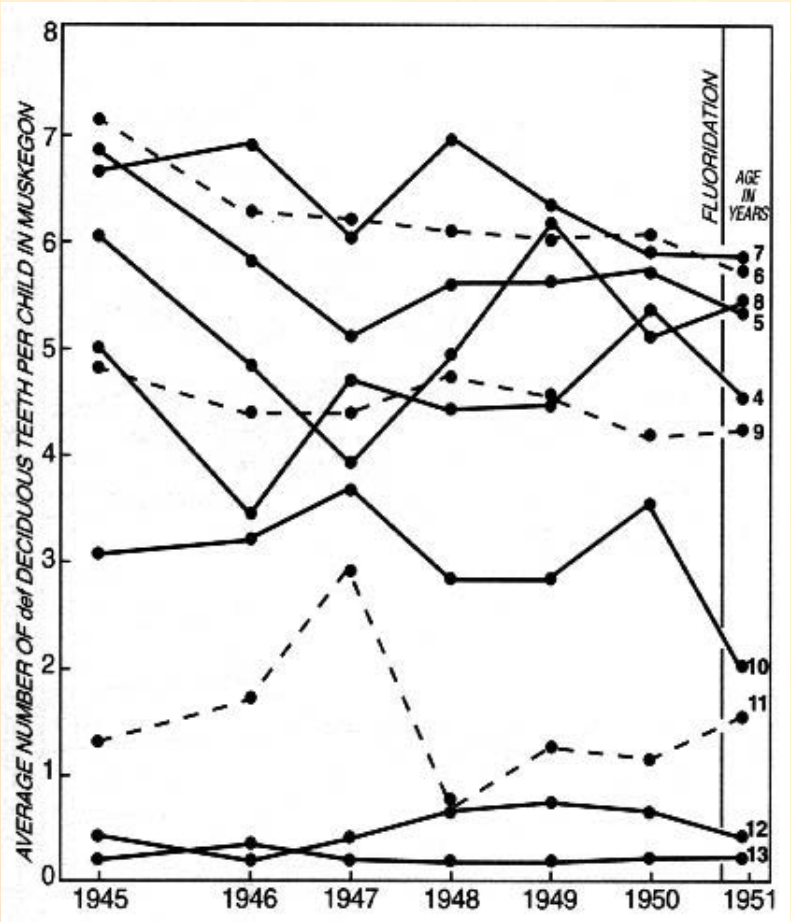

Figure 1. The mean number of def deciduous teeth per child in Muskegon, Michigan, the "fluoride-free" control city for Grand Rapids, Michigan, at each year of examination. The 1945 examination was made in the "late spring", those of the other years, in October and November. Data from Table 2, Arnold et al., 1956. Three months prior to the 1951 examination the water of this city was fluoridated. It has been stated (see p. 145 - 146) that these rates "remained unchanged" during the period shown.

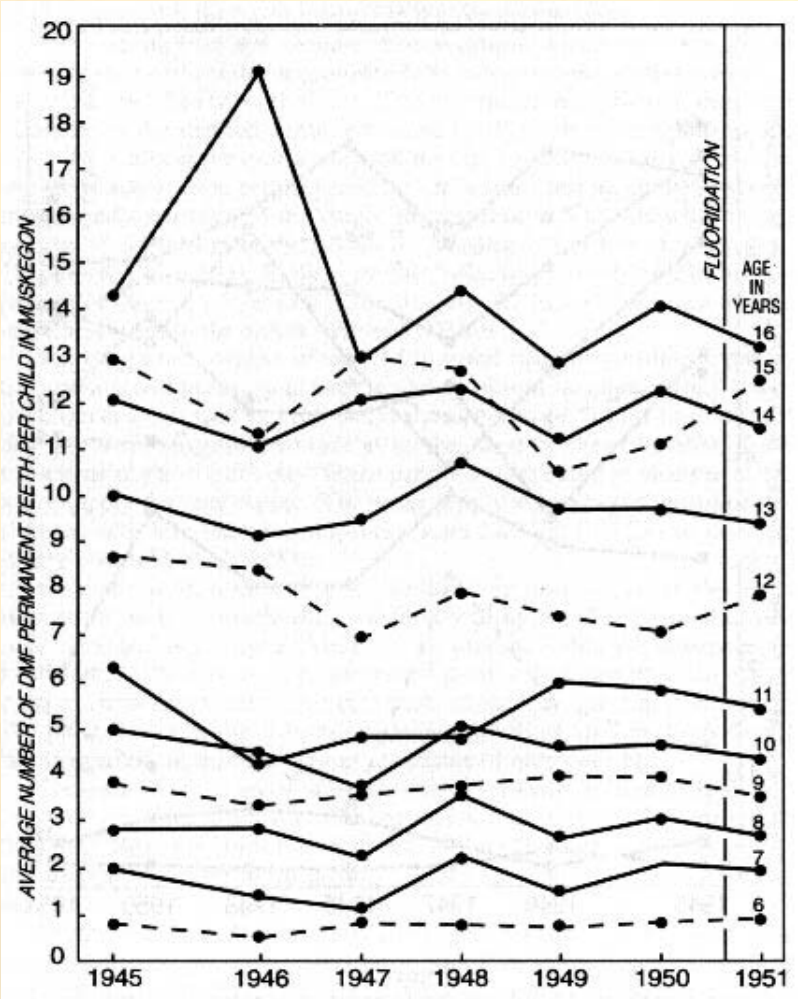

Figure 2. The mean number of DMF permanent teeth per child in Muskegon, Michigan, the "fluoride-free" control city, at each year of examination. Data from Table 3, Arnold, et al., 1956. It has been stated (see p. 145 - 146) that these rates "remained unchanged" during the period shown.

THE EVANSTON STUDY

The United Kingdom Mission (1953), after having observed the Evanston study, described it as "one of the most elaborate investigations." Hill et al. (1950) considered that they had planned the study so "as to measure every variable that might exert an influence and obscure the findings." It is the only trial in which bite-wing examinations were made for all subjects examined.

The importance of X-ray examinations. Blayney and Greco (1952) reported that in this trial "the X-ray disclosed 53.84 per cent of the total number of carious lesions observed by both clinical and X-ray methods". That said: "We believe it extremely important to employ both clinical and X-ray techniques in any study program which is directed toward the determination of the prevalence or the control and reduction in the rate of caries attack." This result must throw considerable doubt on the accuracy of the caries attack rates which were reported from the test and control areas in the other studies considered; for in these, X-ray examinations were incomplete or absent.

The ideal control community. The authors of the study stated that "It seemed logical to think of Oak Park, Illinois, as the ideal control community because of its close similarity to the study area" (Blayney and Tucker, 1948). The manner in which that city resembled Evanston was not stated. The United Kingdom Mission (1953) made the important observation that in Evanston the economic level was high, and "dental care was outstandingly good."

Lower caries rates in control community. It soon became apparent that Oak Park could not be called "the ideal control community", for Hill et al. (1951) stated that "Comparison of the caries rates of all children in the study area (Evanston, Ill.) and the control area (Oak Park, Ill.) prior to the addition of sodium fluoride to the communal water supply of the study area indicated a lower caries rate for school children of the control area."

Different rates in student groups. The authors continued:

> In an effort to find the source of these differences in caries prevalence, it was found to be due largely to differences in the make-up of the student groups examined in the two areas. While in the study area 22.2 per cent of the children examined were attending parochial schools, no such children

were included in the control area: and while 5.6 per cent of the children in the study area were Negro children, only 0.1 per cent of the children in the control area were Negro. Statistically significant differences were found to exist between the caries rates of Negro and parochial school children on one hand and public white school children on the other hand. Generally the caries rates of parochial school children were found to be higher and those of Negro children lower than those of white children in public schools.

Exclusion of data. Hill et al. (1951) continued:

Therefore, comparisons of caries rates for the study group and the control group are based on the caries experience of public white school children only, while such comparisons involving children in only the study area are based on the caries experience of all children in total. The caries rates for the Evanston white school children in the 1946 survey and the Oak Park white school children in the 1947 survey were very similar.

Six lines later, it was stated: "In further comparing the rates for Oak Park (control) and Evanston (study area) it is apparent that the baseline figures are very similar."

The only comparisons that can be made from the paper which has just been mentioned are the figures for the children aged twelve, thirteen and fourteen years. Negro and parochial school children constituted 27.8 per cent of the Evanston children. By excluding this part of the data the rates in that city were then considerably lower than those in the control city, the rates (Table IV) being 707.51, 946.17 and 1133.33 in every 100 of the Evanston public school white children for the ages twelve, thirteen and fourteen years; those in Oak Park being 774.29, 970.00 and 1194.64 for the same three ages.

An altered explanation. A different, but, at first sight, a reasonable explanation for the exclusion of the data of Negro and parochial school children, when making comparisons with data from Oak Park, was given in the XV Report (Hill et al., 1957a): "As the control area (Oak Park) examinations included only public school white children it was necessary to evaluate the Evanston data on the basis of school groups, public white, parochial, and Foster (Negro) to make comparisons of like groups." It can be seen that in that paper the exclusion of data was attributed, not to the

fact that this process was undertaken because there was "a lower caries rate for school children of the control area" (Hill et al., 1951), but to the different racial composition of, and type of school attended by the children in the two cities. Hill et al. (1950) mentioned that one of their seven "other objectives" was "to compare the dental caries experience of white with that of Negro school children." No reference was made to the possibility of a difference being found between the rates of white public and parochial school children. However, the original statement (Hill et al., 1951) makes it clear that the different school groups were taken into account only after the unsatisfactory results of the first Oak Park examination became apparent.: "In an effort to find the source of these differences in caries prevalence." In assessing the accuracy of the second (1957a) explanation, it should be realized that in the younger age group "comparisons of like groups", or even the dissection of the data into the three school groups, were not published in the reports dealing with that age group, namely the 1950, 1952, 1954, 1956 and 1957b papers, or even in the XV Report (Hill et al., 1957a) which dealt with both age ranges, but showed this dissection for the children of the older age group only. Furthermore, when, after a delay of more than ten years, the 1947 Oak Park rates for the younger children were published for the first time by Hill et al. In 1958, no "comparisons of like groups" were made by them. The reader is prevented from making this comparison by the fact that, even now, the dissection of this age range into the three school groups has not been published, despite the statement by Hill et al in 1951 that the rates for "school children" were significantly different in each type of school.

"Correction" of data. When making comparisons with the control city, the authors excluded from the three groups of data obtained in the test city the two which diverged most from the rates of the children in the control city (Hill et al., 1951). This process should be considered in connection with the following statement (Hill et al., 1950):

> In order to be able to generalize from our findings, we must be certain that any such variables as effect caries experience are represented in our study to the same extent as in the population. Before drawing any ultimate conclusions, we will, therefore, correct our data in such a manner as to include only those groups of children which are representative of

> the population, with respect to dental caries experience. We feel that this precaution is necessary to allow the ultimate findings to be considered valid and reliable.

However, the process which they described - the arbitrary selection of a section of the data, which is then termed "representative" - instead of making "the ultimate findings to be considered valid and reliable", would render a report based on this selected data unfit for serious consideration.

"Population" sampled. It is not clear what the authors meant by the term "the population." If the population referred to was that of Evanston, the sample of children examined in this study - if properly drawn - provided an unbiased estimate of the dental condition of the population of that city; if only some of the data are included, the results will be biased. If this term "population" was intended to refer to the general population of the U.S.A., it should be realized that the results from Evanston can represent only a stratum of the country as a whole, varying as to climate and racial composition, to mention only two variables.

It will be recalled that the caries rates were said to be significantly different, even between children attending the different types of school in Evanston; and also that the rates in that city were considerably different from those in Oak Park, which was at first stated to be "the ideal control community" for Evanston (Blayney and Tucker, 1948). These differences emphasize the fact that caution should be exercised when applying results obtained in a test city to a wider population, of which the test city may not be representative.

Altered methods in latest report. In the latest report (Hill et al., 1958) which shows the findings for the permanent teeth of children in the control city of Oak Park, the authors have published in the same tables as the results of the control groups, the DMF rates, not of the public school white children, but of the total sample of Evanston children. This is strange in view of their statement that "comparisons of caries rates for the study group and the control group are based on the caries experience of public white school children only" (Hill et al., 1951). It would appear that they no longer held the opinion which they stated the previous year (Hill et al., 1957a) that it is necessary "to make comparisons of like groups."

As a result of this change in procedure the differences between initial caries rates in Evanston and Oak Park are diminished. In children aged twelve to fourteen years, the pre-fluoridation rates reported for the 1,226 public

school white children in Evanston were far closer to the values found in the Oak Park children than were either the rates of the 96 Negro, or of the 379 parochial school children (Hill et al., 19571, 1958). However, the rates of the Negro children were lower, and the rates of the parochial school students were considerably higher than those of the public school white children. By adopting the authors' latest (1958) method, which is to add the results of the three groups, it is found that the pre-fluoridation rates of the twelve and fourteen-year-old children are considerably less divergent from those of the initial examinations in Oak Park - and those of the thirteen white children of those ages. Whether this situation arises with regard to the six-, seven- and eight-year old children cannot be determined, for no dissection into the rates prevalent in the three school groups has been published.

Late examination in the control city. The United Kingdom Mission (1953) stated: "Before fluoridation started a dental survey was made of 4,375 children in the selected groups in Evanston and of 2,493 children in Oak Park. Further examinations have been carried out each year since 1947 and will continue until 1962." However, the examinations in Oak Park were not commenced until after the fluoridation of the Evanston water supply on 11 February 1947, for Blayney and Tucker (1948) stated: "The study in Oak Park was instituted on Feb. 26, 1947". Also, at the time of the United Kingdom Mission Report (1953), no further examinations had been conducted in Oak Park; even in Evanston only one age group was examined during each year, as can be seen by inspecting the "schema for study" published by Blayney and Tucker in 1948, and reproduced in several subsequent reports.

Only two examinations in the control city. This "schema" indicates that the design of the trial provided for only two examinations - eleven years apart - to be made in the control city. It would appear that the authors did not anticipate changes in the caries rates of the control, such as were reported in Muskegon (Arnold et al., 1953), and, as will be seen later, in Sarnia (Brown et al., 1954b), and in Kingston (Ast, Finn and Chase, 1951). The first examination was made in 1947, and the second, although not scheduled until 1958, was commmenced in 1956 when it became apparent that the water supply of Oak Park would be fluoridated (Hill et al., 1956). This examination was completed on 14 November 1956, soon after the fluoridation of the Oak Park water on 1 August (Hill et al., 1958).

A ten-year delay in the publication of data. Caries attack rates for the six-,

seven- and eight-year-old children which were obtained in Oak Park in 1947 (Blayney and Tucker, 1948) have only recently been published by Hill et al. (1958). This great delay is inexplicable and is particularly unfortunate, because it is in regard to these younger children that the major claims are made for reduction of dental caries as a result of fluoridation. No explanation was offered for this delay, and the members of the United Kingdom Mission (1953) did not comment on this strange omission, merely saying that "The incidence of caries among the children aged 6-8 years is compared with the baseline data of Evanston itself while caries experience of children aged 12-14 years is compared with that of Oak Park."

Gross differences in initial caries rates. The latest report (Hill et al., 1958) reveals that in the younger children there were gross differences between the initial caries attack rates in Evanston and Oak Park. The rates were: 46.85, 26.89 for age six years; 153.49, 102.63 for age seven years; and 249.93, 222.44 for age eight years in Evanston and Oak Park respectively.

In regard to the great difference between the pre-fluoridation rate for the six-year-old children in Evanston and the initial one for children of that age in Oak Park, 46.85 and 26.89 respectively, a footnote to Table I (Hill et al., 1958), referring to the former rate, stated: "This figure results from the very high DMF rate of 87.91 found in one school in 1946." However, as the children were drawn "from 24 schools in the study area" (Blayney and Greco, 1952), it is probable that the rates for six-year-old children in most schools approached the figure of 46.85, unless the school with the high DMF rate also happened to provide a disproportionately large number of six-year-old children.

It should be noted that no comment on the magnitude of this rate of 46.85 was made in any of the four reports in which it had been shown previously (Hill et al., 1950, 1952, 1956, 1957a); all of which were published before the rate of 26.89 for Oak Park was released, and therefore before a comparison with it could be made. The rate of 46.85 was used in all those papers - and even in their latest report (1958) - in calculating the "% reduction", and in computing the "Probability of difference due to chance."

Much unpublished data. The members of the Evanston Dental Caries Study devoted most of the years 1947 and 1956 to the collection of data

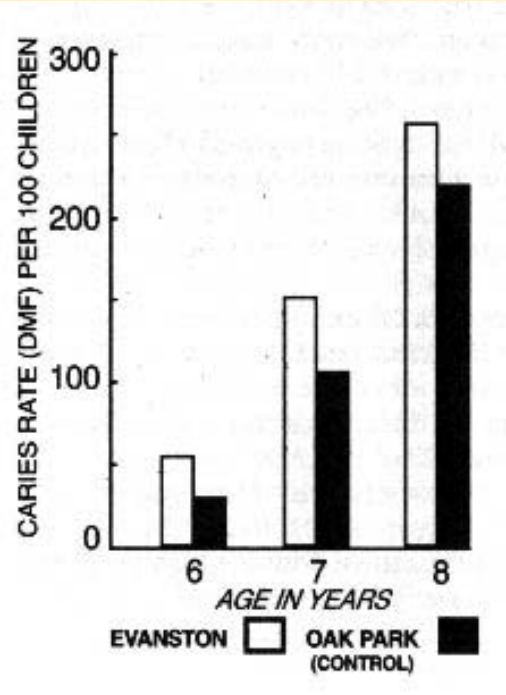

Figure 3. Gross differences in initial caries rates in Evanston and its control city of Oak Park. The Oak Park rates remained unpublished for over ten years.

from children in Oak Park (Blayney and Tucker, 1948; Hill et al., 1958). Despite this fact, the major part of each of the two tables shown in the XVIII Report (Hill et al., 1958) was devoted to a re-presentation of data obtained in Evanston, although this report was said to have as its purpose the comparison of the permanent teeth dental caries experience rates in children examined in Oak Park in 1947 and 1956. The Oak Park data were restricted to four lines of figures showing the DMF rates in permanent teeth. No report was made of other findings such as those which had been shown in reports on Evanston children. For instance, in the XV Report (Hill et al., 1957a), no fewer than eight tables relating to the twelve-, thirteen and fourteen year-old children only were devoted to these other findings. This very incomplete presentation of the data obtained in Oak Park is unaccountable.

Disagreements between results. In their XVIII Report, Hill et al. (1958) stated: "The DMF rates and percentage reduction from year to year for the Evanston children of all age groups shown in Tables I and 2 have been published in previous reports. However, four of the figures for the year 1955, shown in Table I of the 1958 Report, are different from "the rates and percentage reduction" given, for the same year, in Table I and the text of the XVI Report (Hill et al., 1956). The DMF rates at age seven years were only slightly different (40.95 and 40.92, in the XVI and the XVIII Reports respectively), but at age eight years the two rates were 114.04 and 120.32. It is very improbable that these different rates are due to typographical errors, for they were confirmed by the "per cent reduction from 1946", which was given in the summary and in Table I of the respective reports as 73.32 and 73.34 for children aged seven years, and as 54.37 and 51.85 for those that were eight years of age. This "reduction" was shown in the XVIII Report as 85.96 for the six-year-old children, but in the XVI Report it was given as "80 per cent" in the findings and as "85.96 per cent" in the summary.

Disagreement between tables. The DMF rate in terms of tooth surfaces was given only twice in this study (Hill et al., 1955, Table X and 1957a, Table XII). In both papers the "DMF rate per 100 surfaces" for children aged fourteen years was 14.82 in 1949 and 13.94 in 1952. However, in the former report this rate was given as 15.09 in 1946, but in the latter one, for children of the same age in the same year, the figure shown was 15.92. As a result of this change, the "% differences from 1946" were altered from 1.78 to 6.85 (1949) and from 7.62 to 12.44 (1952). By using these new rates it can be said that "all 3 methods, namely; per hundred children, per hundred teeth, and per hundred surfaces all express approximately the same proportion of percentage differences in rates" (Hill et al., 1957a). This result is a good illustration of the comment made on the method most commonly used in these studies to express changes in caries experience, that "relatively small variations in the baseline values will produce substantial alterations in the percentage reduction obtained" (Part One, p. 137).

It may be mentioned that the "total tooth surfaces considered" for thirteen-year-old children in 1954 (Table X11, Hill et al., 1957a) should be 58,325 not 58,352; and that for fourteen-year-old children in 1949, in the column of that table giving the "% differences from 1946", the figures shown should be 6.91 not 6.85. In their XI Report (Table IX) and their XV Report (Table

XI), Hill et al. (1955, 1957a) showed different figures for children aged twelve years examined in 1952. Although both tables show the same total number of teeth considered, in the former table children were shown as examined, with a "DMF rate per 100 teeth" of 25.76, and a difference from 1946 of 19.50 per cent. In the latter table, the figures were 516, 25.60 and 20.00 per cent respectively. In 1953 Hill et al. published the figure of 19.50 per cent.

No data for deciduous teeth. The authors have not published any data regarding the deciduous teeth of children in the control city, either for the first (1947) or the second (1956) examination. The most important omission, the def rates, could have been shown by adding only two lines to Table I in Hill et al. (1958). This omission is particularly unfortunate in view of the fact that in the deciduous teeth in Evanston during the first four years of fluoridation the def rate of the six to eight years group was considerably higher than the initial one (Hill et al., 1952). It was not until nine years after the commencement of the study that a significant reduction in this rate was reported.

In 1950, Hill et al. stated that the caries rate for deciduous teeth in these children "does not indicate any trend", despite the fact that in Table I of that report the initial rise in this rate during the first two years of fluoridation was shown by them to be statistically significant ($P = 0.005$). Two years later these authors altered their opinion of the significance of this rise. In 1952 they re-published the same data for children aged six, seven and eight years in 1946 and 1948, but computed different rates for the combined age group six to eight years. The rise in the def rate was then said to be not statistically significant.

Variations in caries rates in control. The meagre data regarding caries attack rates in Oak Park which have been published are included in Tables I and 2 of Hill et al. (1958). Of the six age groups shown, between the years 1947 and 1956 the authors reported a significant increase in the DMF rate of children aged seven years, and non-significant upward trends in the rates of those aged eight and thirteen years, and downward ones in the caries attack rates in children aged six, twelve and fourteen years. (The question of "significant" changes in the rates in control cities will be considered later.) The authors said: "The children 12, 13 and 14 years of age, Table 2, have only minute differences between the 1947 and 1956 rates. These are not

considered to be significant." The footnote to that table is more definite, in each comparison stating: "Difference is not statistically significant." Although these differences of 61.20, 34.96 and 58.87 DMF teeth, for children aged twelve, thirteen and fourteen years respectively, were termed "minute differences", those seen in the rates of the twelve and fourteen-year-old children are approximately a third the size of the absolute drop in the rates recorded for the same age groups in Evanston since the inception of fluoridation. It cannot be assumed that the fluctuations in the rates during the intervening period of nine years, when no examinations were made, did not exceed the differences between the initial and final rates. It will be recalled that considerable variations occurred in Muskegon (see Figs 1 and 2).

Inadequacy of the control. Blayney and Tucker (1948) realized that "A study of this nature must have an adequate control." Therefore, it is strange that in the "schema" which they published there was provision for only two examinations, eleven years apart, to be made in the control area. It should have been obvious that the usefulness of data gathered in such a manner would be, at most, very limited. The explanation given by the authors for their failure to examine the children in the control city "every year" (instead of only twice) was the strange one that "It was not necessary to do so in as much as Evanston and Oak Park are subjected to the same advertising campaigns, have a similar economic level, participate in comparable educational programmes, and so forth" (Hill et al., 1958). It is extraordinary that the authors advanced this explanation and that they adhered to such a plan, despite the marked dispanity in canes rates disclosed in the first examinations in Evanston and Oak Park (Hill et al., 1958), which makes it obvious that the latter city was a poor choice in seeking an "adequate control" for the former one.

Differences between school groups. Hill et al. (195 1) stated that "statistically significant differences were found to exist [in 1946] between the caries rates of Negro and parochial school children on one hand, and public white school children on the other hand." However, they made a further statement that "the caries rates of parochial school children were found to be higher and those of Negro children lower than those of white children in public schools" (Hill et al., 195 1). These two statements are inconsistent. The first appears to mean that the comparisons between Negro children and white children in public schools, and that the comparison between white children

attending parochial schools and those attending public schools, were both statistically significant in 1946.

"Nearly comparable" or significantly different? The XV Report Hill et al., 1957a) stated that "In 1946 and 1954 the public school white children and the Foster School (Negro) children maintained nearly comparable DMF rates". The actual rates" (per 100 children) in 1946 for twelve, thirteen and fourteen-year-old white children attending public schools were 707.51, 946.17, and 1133.33; for the Negro children of the same ages they were 658.82, 861.76 and 1035.71. (The rates of each school group of younger children were not published.)

It is not understood how the same authors could on one occasion (Hill et al., 195 1) state that there were "statistically significant differences" between the two series of rates, and later (Hill et al., 1957a) describe them as "nearly comparable DMF rates" It may be thought that the word "maintained" referred to a comparison between the DMF rates of the white children in public schools, and of the children in the Negro school, between 1946 and 1954. However, this cannot be the case, for the authors claimed for these twelve, thirteen and fourteen-year-old children "a reduction of approximately 21.96 per cent in dental caries-experience rates of the permanent teeth" (Hill et al., 1957a). (In this study, percentages were frequently shown "approximately" to two decimal places.) Table IV of that paper shows that both the Negro and the public school children participated in the reductions reported.

Decline in eruption rate. An observation of considerable interest is obtainable from Tables V and VI of the X Report (Hill, et al., 1952). The former table shows the rates per 100 six, seven and eight-year-old children that had occlusal surface pit and fissure caries or fillings in their first permanent molars; the latter one, the number of these teeth which were free from those defects. The mean number of erupted first permanent molars per 100 children may be obtained, in each age group, by adding these two rates to that showing the extracted and congenitally missing permanent molars. It is probable that the number of congenitally missing teeth was negligible and that the number of permanent molars which had been extracted in these young children was small, particularly in the six years age group (five and a half to six and a half years). Therefore, it would be expected that, in each age group, the mean number of erupted molars per 100 children would be similar at the time of each examination. This was the case in children aged eight years; the figures for the examinations made in 1946 (pre-fluolidation),

1948, 1950 and 1951 being (to the nearest whole number) 387, 387, 384 and 386 respectively. At age seven years the numbers erupted were 330, 336, 320 and 315; but in the six-year-old children, the number of erupted molars showed a marked and progressive decline 189, 156, 140 and 132 during the period covered by those four examinations.

The question naturally arises whether the eruption rate of these teeth had decreased; a possibility of extreme importance in interpreting the results of a fluoridation trial. However, further consideration of this matter is prevented by the authors' failure to publish this type of data when they reported the results of the two later examinations (conducted in 1953 and 1955) which were made of children of these ages; and the "schema for study" indicates that children aged six to eight years will not be examined again until 1960.

This failure to publish this type of data for the 1953 and 1955 examinations

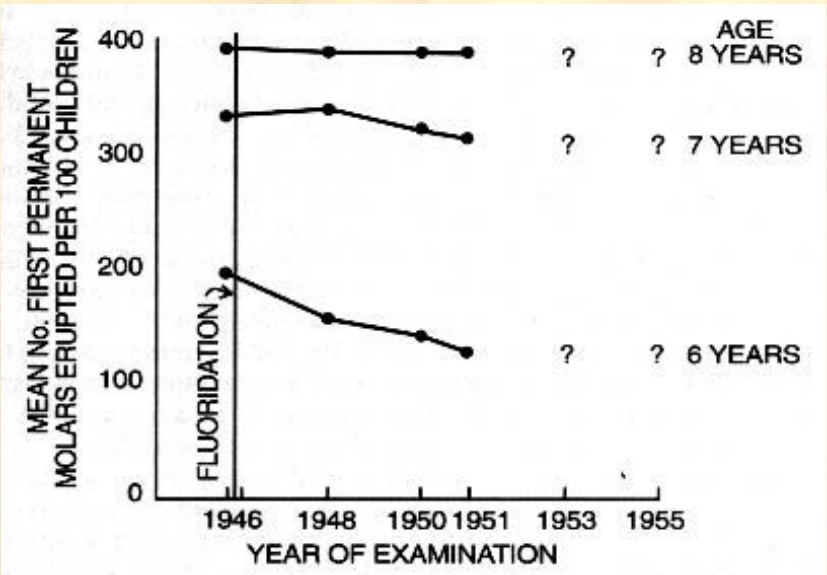

Figure 4. Suggestion of a progressive decline in the number of erupted first permanent molar teeth in six-year-old children in Evanston. The results obtained in the examinations conducted in 1953 and 1955 were omitted from the published reports.

is extraordinary, especially in view of the fact that the authors continued to show similar data for the permanent molars of the older age group (Hill et al., 1955, 1957a); the latter report, the only one showing results for both age groups, gave the prevalence of occlusal pit and fissure caries and fillings in the molars of the older, but not of the younger age group.

In considering the eruption of teeth, the odd method of assessment used in this study must be taken into account. Hill et al. (1955) said: "Only teeth which were 50 per cent or more erupted were considered. A carious or filled tooth was, of course, considered regardless of its stage of eruption."

Strange superiority of artificial fluoridation. The authors of this study compared the Evanston DMF rates per child with those of children in Aurora, Illinois (Dean et al., 1950) in the expectation that after sufficient time had elapsed for all the erupted teeth to have been formed since fluoridation commenced "the Evanston rate will closely approach the Aurora rate" (Hill et al., 1957a). It is surprising that this parity between the rates of Aurora and Evanston was expected, because in the Aurora survey only clinical methods of examination were used, but in the Evanston examinations X-ray surveys were used routinely. Hill et al. (1951) stated: "We find our baseline figures for caries experience in Evanston and Oak Park approximately 32 per cent higher than those of Dean and his co-workers for Evanston and Oak Park in 1941. We assume this may be explained partially by differences in the techniques of examination, particularly in the use of X-ray in the current investigation." The United Kingdom Mission (1953) stated that in this study "the minutest radiolucency was taken as indicating caries."

In view of these findings, it is even more strange that Hill et al. (1957a) were able to report: "The Evanston 6 and 7-year-olds of 1953 have a lower dental caries experience rate after 71 to 82 months of fluoridation than the Aurora 6 and 7-year-olds of 1945-1946 with lifetime exposure to water naturally fluoridated to 1.2 ppm." That this difference was not only slightly below the 1945-1946 Aurora rate for children of the same age" (Hill et al., 1957a) can be seen by comparing the actual rates reported. In Evanston and Aurora respectively, the rates were 14.73, 28.0 at age six years and 53.35, 70.5 at age seven years (Hill et al., 1957a; Arnold et al., 1953). It should be noted that in Evanston two years previously (195 1), after a shorter period of fluoridation, the rate for the six-year-old children was even lower, 12.36 (Hill et al., 1952) and was less than half the Aurora rate; in 1955 (Hill et al.,

1956) it had become 6.58, less than a quarter of the Aurora rate. Blayney and Greco (1952) found that in children in the Evanston study, with regard to proximal caries "the 6-year-olds have the highest percentage (83.90) disclosed by X-ray findings only. In the 7-year-old group 79.04 per cent of proximal lesions were demonstrated by X-ray findings only". Therefore, if clinical methods of examination only had been used in Evanston, as was the case in Aurora, what may be thought to be a strange superiority of artificially over naturally fluoridated water as a means of reducing dental caries attack rates would have appeared to have been even more marked.

"Weighting" of results. The method of combining the results of the six, seven and eight-year-old children into one category introduces an important source of error when comparisons are made between the results obtained in the control city and in the test one, or between those found on different occasions in Evanston. Owing to the great differences in caries attack rates which are observed between children of these ages (the baseline DMF rates for these three ages in Evanston were 46.85, 153.49, and 249.93, according to Hill et al., 1950), the results may inadvertently be "weighted" by including a preponderance of young or of old children in the age group six to eight years. If this occurs, the average value will be lower or higher than it would have been if the three ages had been equally represented in the sample. In comparing the results of the control and the test cities, "weighting" of this nature could make it appear that large differences were present, when, in fact, they were either slight or absent, or the presence of actual differences could be hidden.

An example of "weighting". The results of the pre-fluoridation, and of the first post-fluoridation survey at Evanston (Hill et al., 1950), clearly demonstrate the process of "weighting" and show that its occurrence is not merely a theoretical possibility. On these two occasions, the number of children in each of the age groups six, seven and eight years that were examined in 1946 was 461, 759 and 771 respectively; the corresponding numbers seen in 1948 were 756, 838 and 440. On both occasions the results of the three ages were combined, and a caries rate was computed for the age range six to eight years.

Significant tests and 'weighting'. Despite the rather obvious "weighting" in the examples which have just been cited, tests were applied to determine the significance of the difference between the caries attack rates found during

the two examinations in the combined age range six to eight years. In regard to the permanent teeth, it was stated that "The probability of this difference being due to chance is 0,0000" (Hill et al., 1950). Curiously, in those teeth a decrease in the caries rate was reported, contrasting with the statement of a significant rise in the rate of the deciduous ones.

Random variation ignored. Hill et al. (1950) stated: "It is to be expected that the rate of caries in all teeth varies from year to year due to chance. A significant reduction of caries prevalence can therefore be assumed to exist only when the statistical analysis of the data provides almost absolute certainty that the observed differences are not due to chance." However, in a subsequent paper (Hill et al., 1956) these authors ignored the variations in the intervening years, even when these were as marked as those in Table 5 of that report, and stated: "Difference between 1946 and 1955 rates is statistically significant."

Original results altered. In the X Report (Hill et al., 1952), and in all the later ones, alterations were made to the rates shown for the years 1946 and 1948 in children of the combined age group six to eight years, which were published by Hill et al. in 1950 (Tables I to VI). The original rates were replaced by values which are the means of the mean rates for the children of each of the three ages six, seven and eight years (Hill et al., 1952, Tables 11 to IX).

System of computation changed. The change in the system of computation was explained by Hill et al. (1952) in these terms: "The group averages, shown in previous reports, represents weighted averages of the individual mean caries rates. Inasmuch as the composition of the groups of children with respect to the number of 6, 7 and 8-year-olds varies from year to year, it was felt that unweighted group averages form a more sound basis for comparison of group caries rates between years."

The new method of computation. In 1952 Hill et al. stated that "The new averages were obtained by taking a simple arithmetical mean of the individual caries rates of the 6, 7 and 8-year-old children." This description of the new method is apt to cause some confusion, for it is considered to describe accurately the old method. It was used by these authors in 1950, and then abandoned by them in favour of the new one. The results for 1950 and 1951 in Table IV of Hill et al. (1952), and those for 1953 in Table I of

Hill et al. (I 957a), and for 1955 in Table I of Hill et al. (1956) make it clear that in this new method of calculation, the rate per 100 children aged six to eight for each examination was obtained by taking a simple arithmetical mean of the mean rate for each of the three ages six, seven and eight years.

Errors in amended rates. The amended rates published by the authors (Hill et al., 1952) for the age group six to eight years need further amendment, and the difference between them is even less than that stated. The mean of the three values shown for 1948 in their Table IV, 23.54, 103.58 and 194.09, is found to be 107.07, not 92.07 as stated; also, the mean of the three values for 1946 - 46.85, 153.49 and 249.93 is 150,09 not 149.76. These errors were repeated in the XV and the XVI Reports (Hill et al., 1957a, 1956).

The figure 149.76 was shown also in the XIV Report (Hill et al., 1954). In that report the rate for age six to eight years was said to be "65.82 in 1953." However, in Table I of the XVI Report (Hill et al., 1956) the rate for 1953 for age six to eight years was given as 63.52. The latter figure is the mean of the three mean rates shown for the six, the seven and the eight year-old children.

The XIV Report (Hill et al., 1954) stated: "The combined 6 to 8-year-old children had a permanent tooth DMF rate of 149.76 per 100 children in 1946 and 65.82 in 1953. This is a difference of 60.38 per cent." In fact, by using their standard method of calculation, the "difference" is 56.05 per cent.

A confusing calculation. The situation is made even more confusing by the figures shown in Table 6 of the XVI Report (Hill et al., 1956). If the method commonly used in these trials is employed, when the difference between the DMF rates for 1946 and 1955, which is 95.90 (the rates being 149.76 and 53.86), is expressed as a percentage of 149.76, the "per cent difference" is 64.04, not 64.11 as shown. However, if the correct figure of 150.09 (which does not appear to have been mentioned in these reports) is substituted for 149.76, the "per cent difference" becomes 64. 11 as shown in their Table 6.

Was sampling used? The six, seven, eight and twelve, thirteen, fourteen year age groups were chosen for study (Blayney and Tucker, 1948), but it was not stated whether all children of these ages (the ages were taken to the nearest birthday) were examined, or whether a sampling method was used. The VII Report of Hill et al. (1951) said that "0. 1 per cent of the children in

the control area were Negro." However, in the XV Report (Hill et al., 1957a) it was stated that "the control area (Oak Park) examinations included only public school white children". It is not clear whether the Negro children in that city were excluded from the examination by design, or by the chance of a sampling method. The former alternative is suggested by the statement of Hill et al. (1955) that "In the control village of Oak Park, only public school children were studied".

Were children "continuous residents"? It is not clear whether all the children included in the early reports (Blayney and Tucker, 1948; Hill et al., 1950, 1951, 1952, 1953, 1954) were "continuous residents". Although the questionnaires recorded the residence record of each child, it was not until the X1 Report (Hill et al., 1955) that the statement was made that "The data given in this report are limited to those children whose entire lives have been on Lake Michigan water." The United Kingdom Mission (1953) stated that "The study includes only white children attending public schools in the city who have lived in the area continuously from birth." However, as the first part of that statement presents an incomplete description of the authors" method, doubt is raised as to the accuracy of the statement made in regard to continuous residence.

Disturbing disagreements. In the following paragraphs are cited some disturbing disagreements between the statements made regarding the number of children examined. No suggestion has been found that more than one series of examinations was conducted in Evanston in each year from 1946 onwards, and in Oak Park in 1947 and 1956. Therefore, although the situation is uncertain regarding sampling and continuous residence. it would be expected that all the reports would agree with regard to the number of subjects of each age that were examined in each individual year. The exception is the XVII Report (Hill et al., 1957b), which compares the caries rates of white with those of Negro children; for it was stated that "in this report no attempt has been made to limit the examinations to continuous resident children." Therefore, it would be expected that the sample sizes shown in this report may be larger than those published in other reports.

Gross discrepancies between sample sizes. The numbers of children of each of the ages twelve, thirteen and fourteen years that were examined in 1946, 1949, 1952 and 1954 were given in the second column of Tables XI

and XII of the XV Report (Hill et al., 1957a), the same figures appearing in both tables. It is to be noted that in eleven out of the twelve cases, the sample sizes given there are different from those shown in Tables 111, V, VI, VII, VIII, IX and X of the same report. In six cases the samples were larger in Tables XI and XII than in the other tables mentioned, and in five cases they were smaller. The largest discrepancy was between the number of children aged twelve years that were examined in 1949. Tables XI and XII showed this figure as 627, and the other tables gave 522 as the sample size. Similar discrepancies (for 1946, 1949 and 1952) are present between the sample sizes shown in Tables IX and X of the 1955 paper of these authors, and Tables 1, 111, IV, V, VI, VII and VIII of that report. The authors (Hill et al., 1957a) stated: "The number of teeth and surfaces associated with the DMF rates from 1946 through 1954 are shown in Tables XI and XII." In other tables mentioned in that report the "Rate per hundred children" was employed, but there appears to be no reason why the number of children examined should not be the same for both of these comparisons. No explanation for the different sample sizes was advanced by the authors.

Disparities in Negro sample sizes. Marked disparities are seen between the sample sizes shown for Negro children, for, judging from Table 10 of the XVII Report (Hill et al., 1957b), data >from only about half of the Negro children aged twelve to fourteen years who were examined in 1946, and of less than a third of those examined in 1954, were included in the XV Report (Hill et al., 1957a). The number studied is given in Table IV of the latter paper as 96 in 1946, and as 79 in 1954. However, the XVII Report (Hill et al., 1957b, Table 10), shows that 188 Negro children of those ages were examined in 1946, and 250 in 1954.

The XI Report (Hill et al., 1955) also shows that 96 Negro children were examined in 1946. The VII and XVIII Reports (Hill et al., 1951, 1958), although they do not state the number of Negro children, indicate the same sample size, 1,701 children, as the XI and XV Reports (Hill et al-, 1955, 1957a). In the last mentioned report, referring to the 1954 results, the authors said: "It is admitted that the Foster (Negro) school sample (79) was limited." Why, then, were so few of the 250 Negro children aged twelve to fourteen years that were examined in that year included in the report? Were less than a third of these children continuous residents?

The situation with regard to children aged six to eight years cannot be

investigated, because the XVII Report is the only one in which the data of the younger age group of Negro children are shown separately from those of the white children.

Further unexplained differences. The position revealed in the last paragraph is further confused by the presence of large variations between the number of white children, aged twelve to fourteen years, whose data were shown in earlier reports, and the number given in Report XVIL In the former reports (Hill et al., 1955, Table 11; 1957a, Table IV) the number of these children examined in 1946 (public plus parochial schools) is stated to be 1,605, but, according to the XVII Report (Hill et al., 1957b, Table 10) the number seen in that year was 1,368. In 1954 the examinations of white children totalled 1,247 (Hill et al., 1957a, Table IV), but the figure of 1,905 is shown in the XVII Report (Hill et al., 1957b).

In the younger children, as no dissection of the data into school groups has been published, only the total number inspected can be considered. The XVII Report (Table 10) states that 1,754 children were examined in 1946 and 2,952 in 1955; but Table I of the XVI Report (Hill et al., 1956) shows 1,991 and 1,376 examinations respectively. The two statements of sample sizes (XVII Report figures minus the XVI Report ones) therefore differ by -237 and + 1,576 children.

It is possible that the larger sample sizes shown in the XVII Report for the examinations in 1954 and 1955 were due, despite the sizes of the increases (171 Negro and 658 white children aged twelve to fourteen years, and 1,576 children aged six to eight years), to the inclusion of all subjects, and not only those who were "continuous resident children". If, at the time of commencement of the study in 1946, children who had not lived in Evanston "continuously" since birth were excluded from the main study, an explanation can be found for the larger number of Negro children included for that year in the XVII Report. However, it is strange that that report, which included children who were not "continuous residents" (Hill et al., 1957b), in 1946 should be based on 237 fewer white children aged twelve to fourteen years and on 237 fewer white plus Negro children aged six to eight years than were included for that year in the other reports mentioned.

Incompatible statements. The authors made incompatible statements regarding the total number of children examined during the initial

examinations in Evanston and Oak Park. In Report II (Blayney and Tucker, 1948) it was stated that the "baseline observations were made on 4,375 North Shore" (study area) "children and 2,493 Oak Park children." These figures were repeated in 1950 by Hill et al. However, Tables I to VI of the latter paper show that 1,991 children aged six to eight years were examined in Evanston in 1946; Tables 1, 11 and III of Hill et al. (195 1) indicate that 1,701 children aged twelve to fourteen years were examined in that year, that is, a total of 3,692 children. One or both of these figures (1,991 and 1,701) were repeated by the authors (or may be obtained by adding figures for individual yearly age groups) in 1952, 1955, 1956, 1957a and 1958.

The third total sample size for Evanston in 1946 is shown in the XVII Report (Hill et al., 1957b). By totalling the figures in Table 10, it appears that 1,754 children aged six to eight years, and 1,556 aged twelve to fourteen years, were examined, a total of 3,310 subjects. From Tables I and 2 of Hill et al. (1958) it is deduced that a total of >2,051 children were examined in Oak Park in 1947 (see figure 5, p. 167).

Therefore, three very different sample sizes were given for the 1946 examination in Evanston: 4,375, 3,692 and 3,310; and two total sample sizes of 2,493 and 2,051 subjects examined in Oak Park in 1947. The smallest sample size for Evanston (3,3 10) was given in the XVII Report, despite the statement of the authors (Hill et al., 1957b) that "in this report no attempt has been made to limit the examinations to continuous resident children."

Remarkable changes in assessment of statistical significance. In the footnote to Table II in Hill et al. (1952) it was stated: "It should be noted that the caries rates per 100 children for the 6-8 year olds as a group shown in this report, vary slightly from those shown in previous reports." Although these were said to be slight variations, the remarkable fact emerges that, although based on the same data, the difference between the 1946 and the 1948 caries attack rates for the deciduous teeth of children of that age range, which was said to be statistically significant (the probability being given as 0.005) in the 1950 Report, was stated by the same authors, in 1952, to be "not statistically significant."

On reading the X Report (Hill et al., 1952), it appears that even more extraordinary changes of opinion with regard to the significance of results based on the same data occur in five comparisons between the rates of permanent teeth; significant differences (probability "0.0000") being altered

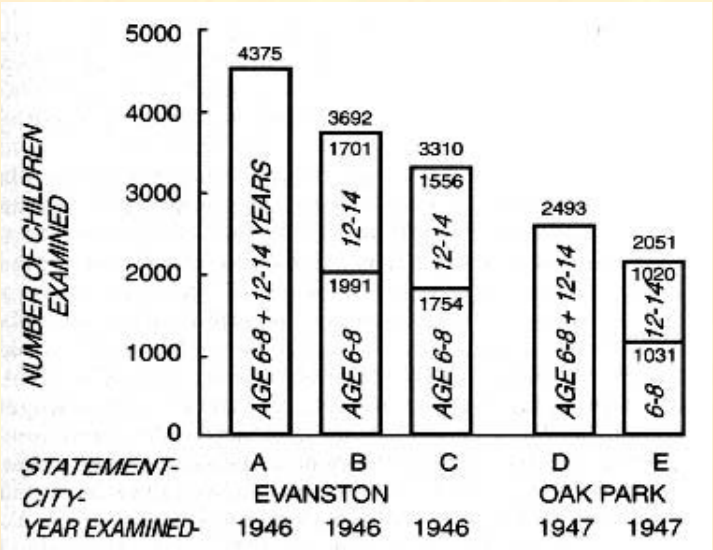

Figure 5. Incompatible statements regarding the number of children inspected during the initial examinations in Evanston and its control city of Oak Park. Evanston statement A is from Blayney and Tucker (1948) and Hill et al. (1950). Statement B is from Hill et al. (1950, 1951, 1952, 1955, 1956, 1957a and 1958). Statement C is from Hill et al. (1957b). Oak Park statement D is from Blayney and Tucker (1948) and Hill et al. (1950), and statement E from Hill et al. (1958). See p. 211.

to "not statistically significant." However, a correction (J. dent. Res., 31, 597) stated that the footnotes to Tables IV, V, VI, VII and VIII were incorrect, and that the statements: "Differences are not statistically significant" should have read "Differences are statistically significant". It is considered likely that the correction is incomplete, and that in the footnote to Table IX of that paper, the word "not" should be deleted. If this alteration is not made, that footnote indicates that the difference between the rates for 1946 and 1948 is "not statistically significant", although two years earlier, the difference computed from the same data was stated in the footnote to Table VI of Hill et al. (1950) to be significant (probability "0.0000") .

At first sight, the employment of statistical terminology in the presentation of this study engenders confidence in the results reported, but the few examples which have been cited clearly indicate their unreliability.

THE BRANTFORD STUDIES

In the city of Brantford; Canada, two independent trials were conducted.

The City Health Department Study

In this study no control procedure was attempted. However, it will be considered briefly because two pre-fluoridation surveys were made by the school dental officer and his assistant (Hutton et al., 1954). This is the only one of these five trials in which more than one pre-fluoridation survey was made in the test city; and, with the exception of Muskegon, none of the control cities provided data obtained in successive years from individual yearly age groups.

Were results combined or averaged? Hutton et al. (1951) stated that "The results of these two [pre-fluoridation] surveys have been combined and are shown in Table I." In Tables I and II of the Ontario Department of Health Report (1956) the rates for those two surveys were shown separately. With the exception of those of the nine-year-old children, for both the deciduous and the permanent teeth, the mean of the two rates for each age is identical (to one decimal place) with the mean rate computed from the figures of the combined survey which were supplied by the authors (Hutton et al., 1951, Table I). This result could have arisen only if (with the exception of the children who were nine years old) the number of children of the same age examined on both occasions was equal, or almost exactly so - a most unlikely event; or if the results were not combined, as stated by the authors, but the rates obtained in 1944 and 1945 were averaged. The United Kingdom Mission (1953) stated that "the average figures of these two years" were used. If the rates for the two years were averaged, there were errors in computing the rates of the nine-year-old children, or errata in one or more of those three tables. The figures shown in Tables I and II of the Ontario Department of Health Report (1956) should be treated with caution, because in both of these the year of fluoridation is stated incorrectly, and in the former table the "% Reduction Since 1944-45" for age seven years should be 66, not 51; whereas in the latter one, the "% Reduction Since 1948" for age nine to eleven years in Stratford and Sarnia should not have been indicated by dashes, but by five and sixteen respectively.

The National Health and Welfare Study

The other study in Brantford was conducted by the Canadian Department of National Health and Welfare, and was described by the New Zealand Commission of Inquiry (1957) as "the most complete of the 10-year North American studies".

Late commencement. Unfortunately, this trial was not begun until January 1948, over two and a half years after the commencement of fluoridation of the Brantford water supply (Brown, 1951). Such delay must affect the value of this study, unless it is assumed that the structural theory of reduction of dental caries as a result of the ingestion of fluorides is correct, and that this is the only way in which fluorides may affect the incidence of caries. This theory was advanced by Cox and Levin in 1942, and was widely accepted at the time these trials were initiated (Dean et al., 1950; Ast et al., 1950). If this theory is correct (as was noted in Part One), little change can be expected in the DMF rates until about six years after the commencement of the study. It is evident that this theory must still be held to be correct in some quarters, for the recent report of a dental caries survey conducted by McCauley and Frazier (1957) stated: "Although fluoridation of the Baltimore City water supply was begun Nov. 26, 1952, (27 months before the survey), there was no reason to anticipate substantial change in the caries experience of these children in this relatively short period of time." However, even before the commencement of the Department of National Health and Welfare study in Brantford, the City Health Department examiner's figures for 1947 showed great reductions in the DMF rates since the introduction of fluoridation. This result was not published by Hutton et al. until 1951, but must have been available to the investigators who "came to the scientific rescue of the project early in 1948" (Hutton et al., 1956). Indeed, in his first report, Brown (195 1) acknowledged the help and advice of two of the three authors of the City Health Department Report (Hutton et al., 1951).

The control cities. The city of Sarnia was chosen as the "fluoride-free" control, and Stratford as the control city with a water supply which "contains 1.3 ppm. of fluorine from a natural source" (Brown, 1951). The reasons for the selection of these cities were not given, except that it was said: "sarnia and Stratford, two cities in Western Ontario known to be comparable to Brantford, except for the fluoride content of their water supplies, agreed to serve as controls" (Brown et at.\,1954b). Also, Brown, Josie and Stewart

(1953) said that Sarnia was "a city" which has fluoride-free water and is sufficiently similar in size, location, and other attributes for purposes of the comparison". The United Kingdom Mission (1953) stated: "Before this study was undertaken the socio-economic status of the three communities was examined and found to be reasonably comparable."

Superior dental care in Brantford. The United Kingdom Mission (1953) said: "Brantford, however, over a period of 15 years, has provided more free dental services for children than most Canadian cities, and this has resulted in the ratio of corrected to total defects being higher than in either Sarnia or Stratford." It considered that in Brantford "dental care was outstandingly good." Also, Brown, in 1952, said:

> "the recordings so far obtained indicate both a higher treatment and an apparently better oral hygiene status of the Brantford children when compared with the controls, and it is therefore suggested that caution should be exercised in the interpretation of the rates shown. The lack of a pre-fluoridation survey on a comparable basis is a further limiting factor in interpreting the results."

No pre-fluoridation survey. The authors of this Brantford study (Brown et al., 1953) said:

> "As the study does not include a pre-fluoridation survey, the full amount of benefit which the Brantford teeth have received since fluoridation cannot be illustrated directly from the data for Brantford. Some idea of the extent of the benefit can be obtained by comparison with the data for Sarnia.... By 1948 the Brantford data were not greatly different from those for Sarnia."

This remark suggests that the data for the two cities prior to fluoridation in Brantford were similar, and that this process had had little effect on the caries rates up to the time of the 1948 examination in Brantford.

Doubtful comparability of rates. Owing to the delay in setting up this study, it cannot be established how closely the dental caries attack rates in Brantford resembled those in Sarnia, at the time fluoridation was instituted in the former city. There is evidence that the dental condition of the children in those two cities was not closely comparable, for Brown et al. (1953) stated that "even by the time of the first survey, mean tooth mortality in Brantford was much lower than in Sarnia, for all age groups." This comment implies that, even by the time of the first survey, as a result of fluoridation

the tooth mortality in Brantford had decreased considerably. This concept is not consistent with the one mentioned in the last paragraph. At the time of the first examinations, the tooth mortality in the six to eight years age group was more than four times as great in Sarnia as it was in Brantford, and in each of the other two age groups it was almost twice as great (Brown et al., 1953, Table 3.)

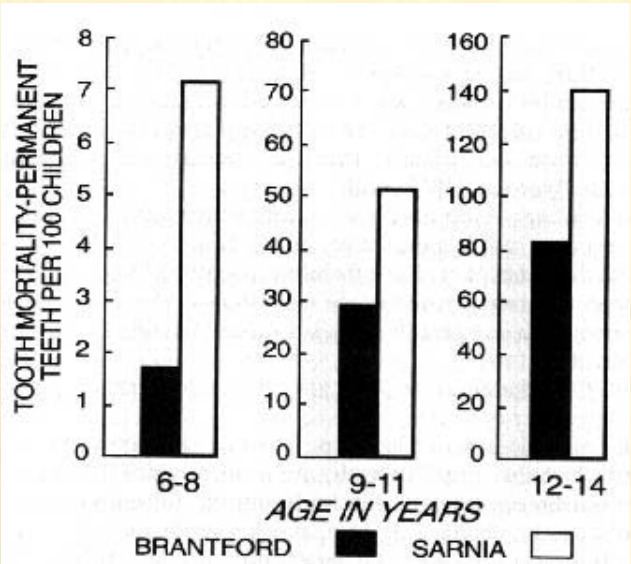

Figure 6. The gross differences observed in the tooth mortality (teeth which are missing or which must be extracted) in Brantford and its control city of Sarnia, during the initial examinations. Canadian Department of Health and Welfare study.

The influence of treatment. The fact that such large differences were reported in tooth mortality rates in the two cities even in the older age groups suggests that dental treatment in them was different, and the authors stated that "Both preventive and treatment measures may have a decided effect on tooth mortality rates" (Brown et al., 1953). It may be recalled that the United Kingdom Mission (1953) noted that Brantford was unusually well provided with free dental services "and this has resulted in the ratio of

corrected to total defects being higher than in either Sarnia or Stratford."

Tooth mortality. Brown et al. (1953) said that "there has been a decrease in tooth mortality in Brantford between successive surveys"; but, in fact, the 1953 rate (Table 3) in the children aged six to eight years was the highest up to that time. This statement was corrected in the next report (Brown et al., 1954b) by prefixing "in almost all cases" to the previous statement. In this connection, the authors remarked in 1953 that, "as well as the fluoridation of the Brantford-water supply, other factors such as differences in preventive or treatment measures are probably affecting the Brantford position." There appears to be no reason why those of the control cities should not have been similarly affected.

Differences in oral hygiene. Additional evidence which suggests that a difference existed between the dental condition of the children in Brantford and that of children in the control cities is provided by the data with regard to oral hygiene. Brown et al. (1954b) stated:

> "Classification and recording of oral hygiene was undertaken because it was considered that marked differences in oral hygiene as between the test and control groups might conceivably affect the findings--or at least might be taken into consideration as a modifying factor, although not a strictly measurable one. However, the figures here suggest that, since 1948, differences in oral hygiene status could not have been a major factor in either the caries level changes within Brantford or the caries level differences between the control cities."

As no comparisons were made between the control cities, the last phrase of the quotation is thought to refer to the caries level differences between Brantford and each of the control cities. The authors' Table 11 indicates that, in the first examinations, in the test city the percentage of subjects who had a good oral hygiene status was almost twice as great as that present in children in both the control ones; these were, Brantford 34.3 per cent, Sarnia 19.7 per cent and Stratford 17.8 per cent. Considerable differences between the oral hygiene status of the children in the test and the control cities were also recorded during the later examinations. These were clearly "marked differences" though the authors did not consider them important.

The concentration of fluorides. Brown et al. (1954b) stated:

> "The Brantford Fluoridation Caries Study was undertaken with a view to finding out whether or not the raising of the fluoride content of a previously fluoride-free water supply to 1 part per million, by the mechanical addition of sodium fluoride, would reduce the incidence of dental caries to that which obtains where water supplies derive about 1 part per million of fluoride from deposits in the earth."

A fundamental requirement of a test of this nature is that the water supply of the control city should contain the same concentration of fluorides as that of the test one, but Brown, McLaren, Josie and Stewart (1956) reported: "The Stratford water supply contains a concentration of fluoride which is 60% higher than that used in Brantford."

Differences of opinion. Several different statements were made regarding the concentrations of fluorides which were present in the water supplies of Brantford and Stratford.

1. Brantford. The New Zealand Commission of Inquiry (1957) said that the water supply of Brantford was "raised to 1.2 ppm. in 1945". The authors of the City Health Department study (Hutton et al., 1951) stated that in February 1949, "the dosage was raised to produce 1.20 ppm."; but in 1954 they stated that "The fluoride content of the finished water is maintained at 1 ppm." In reporting the National Health and Welfare Study, Brown (1952) stated that "a fluorine concentration of between 1.0 and 1.2 ppm. has been maintained in the water supply continuously" since June 1945; and in 1956 Brown et al. said: "Brantford has had more than 10 years of experience with 1 part per million fluoride in its water supply." These statements that the fluoride content was "maintained" at "1 ppm" and "between 1.0 and 1.2 ppm" should be considered in conjunction with that of the United Kingdom Mission (1953): "For example, in 1951 the average for the year was 1.2 ppm with a variation between 0.75 and 1.45 ppm., however, the figures below 1.1 ppm and above 1. 3 ppm were few in number."

2. Stratford. The supply of Stratford was stated to have 1.2 ppm of natural fluoride in its domestic water (Ontario Department of Health, 1956; New Zealand Commission of Inquiry, 1957). However, in reporting the National Health and Welfare study in 1951 and 1952, Brown stated that it "contains 1.3 ppm. of fluorine"; and, with his co-workers, the following year said

that "in Stratford where the water supply, obtained from deep wells, has contained 1.3 ppm." (fluoride) "from natural deposits continuously since 1917" (Brown et al., 1953). In their next report dealing with dental caries (Brown et al., 1954b), the figure stated was "1.3 to 1.6 parts per million of fluoride"; but in the following report these authors (Brown et al., 1956) said that this water supply "contained 1.6 parts per million of fluoride since 1917", and also that 1.6 ppm fluoride content "has been in continuous use for thirty eight years."

These different statements, although strange, may be considered to be unimportant from the practical point of view, but very small changes in the fluoride content of the water may have considerable effects, as reports by Deatherage (1942) and Galagan and Lamson (1953) indicated. The latter authors found that "In water supplies of the Arizona communities studied, concentrations of fluoride above 0.8 ppm resulted in objectionable dental fluorosis; concentrations of 0.6 to 0.8 ppm resulted in an occasional diagnosis of fluorosis; concentrations below 0.6 ppm did not cause objectionable fluorosis." The mean temperatures of these communities were between 67 and 72 degrees Fahrenheit.

Three misleading statements. In the summary of the 1954b report of the National Health and Welfare study, Brown et al. stated that during the period 1948-54 "dental caries experience of children in the two control cities, on the other hand, either has remained at about the 1948 levels, or has increased slightly, at all ages studied." A similar statement was made by them in the 1955 Report (Brown et al., 1956): "During that time [more than ten years] a very important, statistically significant reduction in tooth decay has occurred in all the age groups studied, while in the two control cities of Sarnia and Stratford it has either remained at about the same level or increased somewhat." The last sentence contains three misleading statements about the control cities:

(a) As this study did not commence until 1948 with "examinations in Sarnia beginning in March of that year, and in Stratford in October" (Brown, 1952), and as fluoridation in Brantford commenced in June 1945 (Hutton et al., 195 1), no information is available with regard to the prevalence of "tooth decay" in Sarnia during the first two and three-quarter years, or in Stratford for the first three and a quarter years of the ten-year period of fluoridation which these authors were discussing in their 1955 Report. Therefore, it cannot be known whether this condition

"remained at about the same level" in the control cities during the early years of fluoridation in Brantford.

(b) No remarks were made in the context of this statement in this (or the previous) paper which suggested that reference was being made to the permanent teeth only, but these statements are not correct for the deciduous teeth. (However, in the former paper, a similar statement to that made in the summary was also made under the heading "Mean DMF Permanent Teeth".) Decreases in the df (decayed, filled deciduous teeth) rate were seen in the nine to eleven years group in both Sarnia and Stratford, that in the former city being shown by these authors to be statistically significant (Brown et al., 1954b, Table 10).

(c) In both cities the mean rates of DMF and df teeth per child showed changes which were said to be statistically significant (Brown et al., 1954b).

Omission of decreases. The decreases in the caries attack rates of the deciduous teeth, which have been mentioned above, were also omitted in Table II of the Report to the Minister of Health, Province of Ontario, Canada, by the Division of Medical Statistics, Ontario Department of Health, which was made in 1955 (Ontario Department of Health, 1956). Under the heading "% Reduction Since 1948", these decreases were not shown, but instead, in the appropriate positions dashes were printed, despite the fact that in Sarnia the percentage reduction (determined by the method commonly used in these studies) was 16 per cent, almost as great as that of 18 per cent shown for the same age group in the test city; furthermore, this reduction in Sarnia was stated by the authors (Brown et al., 1954b) to be statistically significant.

Different rates reported. It should be noted that the deficiency in the data of the National Health and Welfare study, owing to its late commencement, could not be decreased by comparing the rates obtained by its examiners with those reported by the City Health Department examiner, because of the considerably lower rates recorded by the last-mentioned examiner when impecting similar groups of children. For instance, in their examination in 1948, for children aged six to eight, nine to eleven and twelve to fourteen years, Brown et al. (1953) obtained rates of 1.41, 4.07 and 7.68 respectively for the permanent teeth, compared with rates of 0.84, 3.37 and 6.11, for the same age groups of children, in the same city and in the same year, obtained by the City Health Department examiner (calculated from Table IV, Hutton et al., 1951).

Significant fluctuations in controls. In the two control cities "where it is presumed that there has been no appreciable change in either preventive or treatment services" (United Kingdom Mission Report; 1953), it can be seen in Tables 4, 6, 8 and 10 published by Brown et al. (1954b) that some considerable fluctuations in the caries attack rates were recorded; more than half of the inter-year differences in each of the control cities being shown to be statistically significant. However, in the text it was stated that the "dental caries experience of children in the two control cities . . . either has remained at about the 1948 levels, or has increased slightly, at all ages studied."

(1) Sarnia. In this city the changes between examinations of the rates for the deciduous teeth were not very marked, but there was a significant one between 1948 and 1954 in the nine to eleven years age group. However, in the DMF permanent teeth, there were four definitely significant (three standard error level) and one significant change in the nine comparisons made. In regard to the first permanent molars, there were six significant (including three definitely significant) alterations in the rates, in the nine comparisons made (Brown et al., 1954b).

(2) Stratford. In this city, the rate of df teeth per child showed a significant difference in one case out of the four comparisons made between successive examinations (Brown et al., 1954b). In the DMF permanent teeth per child, the results of the four examinations were: 0.41, 0.75, 0.47 and 0.67 for the six to eight years group; 1.13, 1.76, 1.46 and 1.89 for the nine to eleven years age group; 2.55, 3.12, 3.02 and 3.77 for the twelve to fourteen years age group (Brown et al., 1954b, 1956). These variations between examinations were so large that five out of the six comparisons made (in the 1954b report) between successive examinations were said to be statistically significant, four of them being at the three standard error level. In the last report published (1956), Brown et al. abandoned the method which they had used in the two previous ones, that of showing the standard error of the mean values of the DMF rates, and of making "Inter-City" and "Inter-Year" comparisons (Brown et al., 1953, 1954b). Therefore it was not stated whether the differences between the 1954 and the 1955 DMF rates in Stratford were significant, but it can be seen that they were marked; the difference of 0.75 in the twelve to fourteen years group being considerably larger than any of those stated in the 1954b report to be significant differences between various examinations in that city. When the DMF rates for the first permanent

molars are considered, similar marked changes are seen, and in five of the six comparisons the differences were significant (four definitely so).

Larger "percentage" changes in a control. If one resorts to the method commonly used in these trials - that of expressing the alteration in the DMF rate as a percentage of the original rate - these unexplained increases in the control city of Stratford between 1948 and 1955, although they were described as "no change" (Ontario Department of Health, 1956), and as "a slightly higher prevalence of dental caries in 1955, over the 1948 levels" (Brown et al., 1956), are found to be 63 per cent, 67 per cent and 48 per cent, for the six to eight, nine to eleven and twelve to fourteen years age groups respectively. In each case these percentage changes are considerably larger than those of 51 per cent, 44 per cent and 37 per cent which can be computed from the data reported for Brantford. The last-mentioned changes were attributed to fluoridation, and each was stated to indicate "a very important, statistically significant reduction in tooth decay" (Brown et al., 1956).

This is just one instance of the strange results which are obtained when this method of calculation is used. It should be realized that it was the one most commonly employed in fluoridation trials, and was used in formulating the often-expressed claim that (as stated by Arnold et al., 1956): "In children born since fluoridation was put into effect, the caries rate for the permanent teeth was reduced on the average by about 60 per cent." The recent World Health Organization Press Release (WHO/45, 4 September 1957) stated - with no mention of age - "The prevalence of dental caries in the permanent teeth of children decreased some 60 percent".

A smaller "percentage decrease" after long fluoridation. The "percentage decreases" which have just been mentioned (51 per cent, 44 per cent and 37 per cent, calculated by the method described in the last paragraph) were not stated in the 1956 report of Brown et al., but the figure of 51 per cent for the six to eight years age group is considerably less impressive than the figure of "approximately 69%" published in the 1954b report from this study. Although the final report (1956) gave the rates for 1948 and 1955 only, and therefore did not show the fluctuations between examinations, from the 1954b and 1956 reports of Brown et al. it is seen that the marked change in the "percentage" decrease which has just been mentioned was due to the DMF rate in Brantford in 1955, for this age group, being the highest seen since 1951. Ignoring the fact that in "children born subsequent

to fluoridation" the "decrease" in the DMF rate had dropped to only 51 per cent, the authors stated in the final sentence of their final report (1956): "For every three decayed teeth they would have had, they have only one."

More misleading comments. Turning from the reports made by the authors of this study about the control cities to some of the comments made by others, it is seen that these are even more misleading. Only two will be mentioned. Martin (1956) stated that during "the 1948-54 period" the "DMF figures for the two control areas have remained at 1948 levels." The authors of the Ontario Department of Health Report (1956) went so far as to state to their Minister of Health that "it had been established that there has been no change in the already low dental caries attack rates in Stratford ... or in the relatively high rates for Sarnia".

These two statements are contrary to the results published by the authors of the study (Brown et al., 1954b), which showed that in both the control cities there were statistically significant differences between the caries attack rates at successive examinations. Out of the fifteen comparisons made, only five differences in the rates were not significant, two changes were significant and eight changes were definitely significant.

Unexplained significant changes in controls. All the changes in the caries attack rates in the control cities which were reported to be significant are unlikely to be chance variations; therefore, to what factor or factors must they be attributed. It is possible that they were due, in whole or in part, to alterations in the "weighting", such as were found in the Evanston study as a result of combining the caries attack rates of children of different ages (Hill et al., 1952). However, as the age composition of the groups was not stated in this study, it cannot be determined to what degree the data was distorted by "weighting", a condition which is almost inevitably present when data drawn from several different yearly age groups are combined.

Apart from deficiencies which are found in other studies also, in this trial there is an absence of any information regarding the caries attack rates in Brantford and Sarnia, prior to the fluoridation of the water supply of the former city. There is also the fact that no explanation was given by the authors for the significant variations in the caries rates in the control areas. Therefore, a marked decrease in dental caries in the test city as a result of fluoridation cannot be said to have been established.

THE NEWBURGH STUDY

The fluoridation trial conducted in Newburgh differs from the other studies in two important ways:

1. In almost all the comparisons made, the data obtained were compared with those from Kingston, the "fluoride-free" control city, instead of the method used in the other trials, by which most comparisons were made between the initial and the latest observations in the test city.

2. The caries attack rates were stated per 100 erupted teeth, instead of per 100 children or per child. The Evanston study was the only other one in which the caries rate per 100 erupted teeth was published; Hill et al. in 1955 and 1957a showed this rate, but only for children aged twelve to fourteen years.

The control city. Kingston was used as the control area. "Both cities are situated on the Hudson River about 30 miles apart. Each has a population of approximately 30,000. The climate of both cities is also similar, and their water supplies at the outset of this study were comparable and have remained so, except for the addition of sodium fluoride to Newburgh's supply" (Ast et al., 1950). Ast and Chase (1953) added the information that the two cities had a "comparable age, sex, and color distribution"; and Schlesinger, Overton and Chase (1950) mentioned that they "bore a close resemblance to each other in respect to size and socio-economic conditions".

Late examination of control city. In Kingston, as in the other "fluoridefree" control cities that have been considered, the basic examinations were not made until after the fluoridation of the water supply of the test city. Fluoridation was started in Newburgh on 2 May 1945 (Ast et al., 1950), but the examinations in Kingston were not conducted until "Sept., 1945 - Feb., 1946" (Ast et al, 1950).

Considerably different composition of waters. In 1950 Ast et al., stated that the water supplies of Newburgh and Kingston "at the outset of this study were comparable and have remained so, except for the addition of sodium fluoride to Newburgh's supply." However, both the source and the composition of the water supplies of these two cities are different. The United Kingdom Mission (1953) stated that the source of Newburgh's water is from "surface water. Algae growths in spring and summer checked by copper sulphate blown on the surface of the water as a powder." The source of Kingston's supply was described as "Mountain spring impounded.

Auxiliary supply, small spring reservoir" (Lohr and Love, 1954).

In regard to the composition and other characteristics of these waters, according to analyses of the finished waters made in February 1952 by the U.S. Geological Survey (Lohr and Love, 1954), in each of the ten items - magnesium, sodium, potassium, bicarbonate, sulphate, chloride, dissolved solids, specific conductance, hardness and alkalinity - the values for the Newburgh water were at least four times as great as those obtained from analysis of the Kingston supply. In the very important matter of the calcium content, the Newburgh value of 35 ppm (Ca) was more than five times as large as that of the Kingston one of 6.6 ppm (Ca). Changes in the supplies during the period of the trial, owing to natural or to treatment-chemical variations, are unlikely to have affected these gross differences more than slightly.

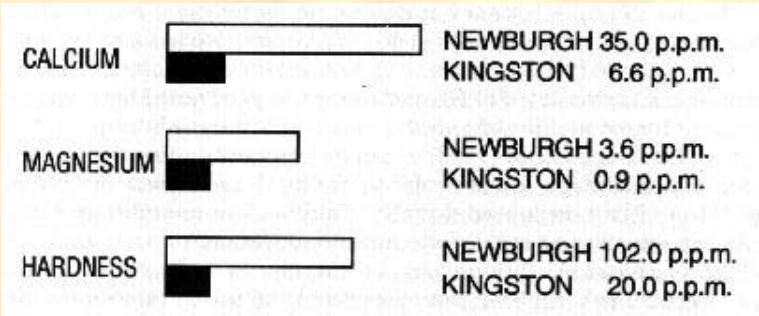

Figure 7. The considerably different calcium and magnesium content and hardness of the water supplies of Newburgh and its control city of Kingston, February 1952. Eight other characteristics of the Newburgh water were at least four times as large as they were in Kingston. The authors of this study stated that these waters "at the outset of this study were comparable and have remained so" (Ast et al., 1950).

An unsatisfactory control. In proposing this study, Ast (1943) said: "Much care must be exercised in the selection of study areas which should be comparable in as many essential factors as possible." The first of these factors which he mentioned was the "chemical composition of past and present water supply". Therefore it is surprising that Kingston was selected as the control city for Newburgh, for it is clear that in this very important matter the two cities showed considerably different values. The importance of the close comparability of the water supplies was emphasized by the statement

of the American Water Works Association (1949) that the experimental verification of the fluoride-dental caries hypothesis "obviously necessitates the use of a nearby "control" city with a water supply comparable in all respects to that to which fluoride is being added."

Variations in methods used. An outstanding characteristic of this study is the variation in the methods used, both in gathering the data and in the presentation of the results. There were changes in the examiners; on some occasions clinical examinations only were made and on others X-rays were also used. The statisticians changed, as did their presentation of the data in age groups. The sampling method varied in regard to residence qualifications, and changes occurred in the age range of the children who were examined. In one report data was obtained from selected schools only. In some examinations the sampling method was different in the control city from that used in the test one, All these matters will now be considered more fully.

The dental findings. These were published in five papers. Ast, Smith, Wachs and Cantwell, in 1956, said: "Progress reports were published after three, four, six and eight years of fluoride experience in Newburgh" (Ast et al., 1950, 1951; Ast and Chase, 1953; Ast et al., 1955). The last-mentioned report (Ast et al., 1955) "after eight years of fluoride experience" gave the results obtained during the examinations of 1953-4. The final report, giving the results for 1954-5, apparently one year later than those in the fourth dental report, was said to show the "dental findings after ten years of fluoride experience" (Ast et al., 1956). However, as fluoridation in Newburgh commenced on "May 2, 1945", and as the examinations given in the final report were made "between October 1954 and June 1955" (Ast et al., 1956), it would appear that, at the most, only a small part of the data of the final examination was obtained "after ten years of fluoride experience."

Different examiners used. The initial examinations in both cities were made by Finn. "The subsequent examinations in Kingston using the same technic were made by two dental hygienists" (Ast et al., 1950). The examinations in 1951-2 were conducted by two examiners, but "Due to loss of one of the examiners during the examination year, it was deemed advisable to use only those examinations made by the remaining examiner in both cities" (Ast and Chase, 1953). The clinical examinations in 1953-4, and the final ones,

were made by Wachs (Ast et al., 1955, 1956). These changes were made despite the fact that in 1943 Ast said that "the examinations throughout the study should be made by the same dentist because of the marked variation in diagnosis of small carious lesions, pits, and fissures by different dentists."

The clinical examinations were supplemented by the use of X-rays in the years 1949-50, 1953-4 and 1954-5 (Ast et al., 1956). In the first of these, which was confined to children aged seven, nine and eleven years, the X-rays were taken by a staff dentist and were read by Ast and Finn (Ast et al., 1951). The next series was taken by Wachs and was read by Bushel (Ast et al., 1955); the final X-rays were taken by Wachs and a staff hygienist, and they were read by Wachs and Smith (Ast et al., 1956).

Non-comparability of data. In the last two reports (Ast et al., 1955, 1956), the carious cavities that were detected by the X-ray were added to those found in the clinical examinations. Ast et al. in 1955 said that "the data in this report cannot be compared directly to those earlier data based on clinical examinations alone." However, in Table 3 of the 1956 report, the results of the clinical examination are shown separately, but a satisfactory comparison with those obtained in the earlier years is prevented by the fact that in this report the data were not published for yearly age groups, but for the age ranges six to nine and ten to twelve years. Data for the other two age groups which were shown in the final report, thirteen to fourteen and sixteen years, were not published in the previous ones.

The rates for the deciduous teeth were given in only one report (Ast et al., 1951).

Examiner variability. The between and within-examiner variability was not investigated, although, early in the study, the importance of this matter was recognized by Ast et al. (1950) when they stated: "We cannot entirely rule out the possibility of variation in the interpretations of the examiners. The fact that more than one examiner was used might alter the differences between Newburgh and Kingston to some extent." In the following year (Ast et al., 1951) it was stated: "In the present report an attempt is made to demonstrate that through an objective roentgenographic examination of the teeth of selected age groups, the question of examiner bias in this study is not likely to account for the differences noted." However, the only data published were those of the first permanent molars; and the finding that "the DMF roentgenographic findings of the first permanent molars only" in selected age groups shows "consistent differences at each age in favor

of Newburgh" does not provide an estimate of examiner variability such as could have been obtained readily by normal statistical methods.

In addition to the changes in the examiners and in the examination methods, there were changes in the statisticians. The report after three years of fluoridation was made in collaboration with one statistician; those after four, six and eight years with a different one; and a third statistician was employed in the preparation of the final report.

Different adjustment procedures. In most of the tables in this study a "Crude rate" and an "Adjusted rate" are shown. The incongruity of making these small adjustments to rates that were obtained by combining data from children of considerably different ages does not appear to have been realized. In some cases even data from children aged between six and twelve years were added (Ast et al., 1950, 1951; Ast and Chase, 1953), the great increase in the caries attack rate between those ages being ignored. The adjustments were made (depending on the type of data) to the tooth population, the first permanent molar population, or the distribution of children. In the first three reports of dental findings (Ast et al., 1950, 1951; Ast and Chase, 1953), they were all made to the appropriate situation in Kingston during the 1955-6 examinations, but the adjustment system was then changed, the crude rates after eight years of fluoridation being adjusted to the situation in Kingston in 1953-4 (Ast et al., 1955), and those shown in the final report to that present in the control city in 1954-5 (Ast et al., 1956).

Variations in age groups. In discussing the Evanston study, it has already been pointed out that the method of combining the results of different age groups may result in "weighting" the data, so that comparisons between the test and the control cities may be affected. In the examples given >from other fluoridation trials in which this method was used, the age groups were consistent from examination to examination; but in the Newburgh-Kingston study the groups varied between examinations, between comparisons made from data obtained during the same examinations, and even the age range of the subjects inspected varied from time to time. In regard to the DMF rate per 100 erupted permanent teeth, the groups were as follows: 6-7, 8-9,10-12 (Ast et al. 1950); 6, 7, 8, 9, 10, 11 and 12 (Ast et al., 195 1; Ast and Chase, 1953); 6, 7, 8, 9 and 10 (Ast et al., 1955); and 6-9, 10-12, 13-14 and 16 years (Ast et al., 1956).

Changes in the age groups were also made in reporting the other data presented in this study, but in many cases the groups were different from those which have just been mentioned.

Grouping of data hinders comparisons. In the final report, Ast et al. (1956) said: "The data are combined for six to nine year old children because these children in Newburgh had used fluoridated water throughout their lives"; and the age groups ten to twelve years and thirteen to fourteen years were associated with the tooth calcification pattern. No explanation has been found for the grouping used by Ast et al. in 1950, but this matter will be considered later.

Whatever may have been the reason for adding the data of children of different ages, it has the unfortunate result of making it very difficult to compare the rates which were present in the test (and in the control) city at different stages of the trial, especially as, in the 1955 report of Ast et al., the rates obtained from the clinical examinations were not shown separately from those computed from the combined clinical and X-ray results.

"Weighting". Even if the explanation advanced by the authors of this study is considered to be a reasonable one, there remains the danger of "weighting" the data by combining into one category such divergent material as is provided by children of different yearly ages. One of the tables in which obvious "weighting" is seen is Table I of the first report (Ast et al., 1950), "weighting" being present in several different forms. In the control city, the total DMF rate per 100 teeth (ages six to twelve years) is "weighted"; for the total number of teeth examined is made up (in 1945-6) of only 11 per cent from the six to seven years age group, with its comparatively low DMF rate, and of 67 per cent from the ten to twelve years group with its comparatively high rate (22 per cent was from age eight to nine years). In the latest examination shown in that table (1947-8), the two percentages were 17 and 59 respectively, so that the comparison between the results of the two examinations is also "weighted". Similar instances of "weighting" are also seen in the data >from the test city; but as these are of a different degree, the comparison between Newburgh and Kingston is another instance of "weighting" (Table 1, Ast et al., 1951). It can be seen that some "weighting" occurred within the age groups used in the baseline examinations, principally in the eight to nine years group in both cities.

Fewer erupted teeth than expected. In the final report (Ast et al., 1956), from Table I it can be calculated that the number of erupted permanent

teeth in the six to nine years group in Newburgh was less than the number expected, on the assumption that the mean age of eruption of each type of tooth was the same as in the children in Kingston. Also, in the ten to twelve years group (by assuming that in these children at least the eight incisors and the four first molars would have erupted) the number of erupted permanent canines, bicuspids and second molars was fewer in Newburgh than would be expected. Statistically speaking, both these differences are highly significant.

Delayed eruption or "weighting"? These results could have arisen by there being a delay in the eruption of these teeth in the Newburgh children, for it is unlikely that the eruption rate altered in the Kingston subjects. However, Ast et al., (195 1) said that "there does not seem to be any change in the eruption pattern among the children in Newburgh, the study city, as compared with those in Kingston, the control city." No definition of an "erupted tooth" was given, but it is presumed that the authors of this study did not adopt the odd method used in Evanston, where "Only teeth which were 50 per cent or more erupted were considered. A carious or filled tooth was, of course, considered regardless of its stage of eruption" (Hill et al., 1955).

The conclusion of Ast et al. that has just been mentioned was reached only four years after the commencement of fluoridation, and as the teeth considered were partially formed prior to the commencement of that process, they would not show effects which the ingestion of fluoridated water may produce on the early stages of tooth development.

If delay in eruption did not occur in Newburgh, the lower number of permanent teeth present at those ages in that city compared with that present in Kingston was due to a "weighting" effect; there having been, in proportion, more young children in each of these age groups in Newburgh than there were in Kingston. If this is the case, as it is reasonable to assume that the mean DMF rates of the younger children were lower than those of the older ones, it would appear that in these age groups the contrast between the DMF rates in Newburgh and those in the control city was exaggerated in the final report.

"Smoothing" of initial rates. In 1951 Ast et al. reported that the "initial clinical examinations made in Newburgh and Kingston in 1944-1946 were made by one examiner, at which time the DMF rates were the same." However, reference to Table 2 in that paper shows that the DMF rates per

100 erupted permanent teeth were, in Newburgh and Kingston respectively, at age six years, 8.5, 7.2; age seven years 11.7, 12.0; age eight years 17.1, 17.3; age nine years 21.2, 18.9; age ten years 21.9, 21.3; age eleven years 21.8, 21.8, and age twelve years 25.3, 25.4. Also, Table 5. which shows the DF rates per 100 deciduous teeth present, gives the rates in Newburgh and Kingston respectively as 27.2, 21.5 at age five years; 34.2, 32.1 at age six years; 42.3, 43.3 at age seven years, and 48.0, 47.2 for the eight-year-old children. Data for the DF rates of the deciduous teeth of older children were not provided.

In the first report of this study (Ast et al., 1950) no results were given for the deciduous teeth, and the results for the permanent ones were presented in three age groups, six to seven, eight to nine and ten to twelve years. It can be seen that by adding the data from children aged six years, in whom the DMF rate in Newburgh was higher than that in Kingston, to those of the seven-year-old children, in whom the reverse situation was present, the divergence between the rates prevalent in the two cities was reduced. In Table I (Ast et al., 1950) the combined rate was shown as 10.7 in Newburgh and 10.8 in Kingston. In a similar manner, the addition of the data for eight and nine-year old children and those of children who were ten, eleven and twelve years of age produced a levelling effect between the rates of the two cities in these two combined age groups. This process of combining data >from children of different ages, when reporting the DMF rate per 100 erupted permanent teeth, although it was employed in only the first and the last dental reports, may have been used in order to simplify the presentation of the data; but it had the unfortunate effect of disguising differences between the DMF rates in the two cities at the time of the basic examinations. In the next report the situation was stated more accurately, Ast and Chase (1953) saying that “the DMF rates in both cities were approximately the same at the start of the study”.

Fluctuations in the control city. In this, as in other studies, it is found that the comments made in the text tend to underrate the changes that took place in the dental caries attack rates in the control city. In the summary of the paper by Ast et al. (195 1) it was stated that “the DMF rates in the control city of Kingston show no changes.” In that paper, Table 2 shows the DMF rates per 100 erupted permanent teeth; in Kingston the “per cent change” in the rates of the four age categories six, seven, eight and nine years were 30.5,

7.5, 0.6 and 9.5 respectively. Small changes were shown for ages ten, eleven and twelve years. It should be noted that the six, seven and eight-year-old children all showed decreased rates between 1945-6 and 1949. No attempt was made to explain these decreases, and the water of Kingston "remained fluoride deficient throughout the study period" (Ast et al., 1956).

Fluctuations disguised. The method used by Ast et al. in 1951 was to compute the mean DMF rate per 100 teeth in all the children aged six to twelve years; the Kingston rate for this combined age group declining slightly from 20.2 to 19.9 between 1945-6 and 1949. However, by adjusting to the "permanent tooth population in Kingston 1945-6 examinations", the authors showed that the rate of 19.9 became 20.2. On this basis it could be claimed that the "rate" in Kingston had not changed, but the incorrect statement was made that the DMF "rates" in the control city of Kingston showed no "changes". These rates of 19.9 and 20.2 were produced by combining the data of young children - that had few erupted permanent teeth and relatively low DMF rates per 100 teeth with data of older children that had most of their teeth erupted, and considerably higher DMF rates per 100 teeth. The rate obtained in 1949 was then adjusted. This procedure, no doubt unintentionally, disguised the fluctuations in the rates in the control city.

In Table 2 (Ast et al., 195 1) the "per cent change" in the Kingston children aged nine years was shown as 9.5, but if the figures 18.9 and 19.1 are the correct ones for the years 1945-46 and 1949, the "per cent change" should have been stated as 1.1, not 9.5.

Variability of caries rates. Unfortunately, the variability of even the mean caries rates cannot be studied, for the rates of yearly age groups were not published in the first and the last reports (Ast et al., 1950, 1956), and the only results shown in the 1955 report of Ast et al. were based on a combined clinical and X-ray examination.

The meagre data supplied for deciduous teeth. Data regarding the caries rates of the permanent teeth were shown in each report of this study; however, only very meagre data were published for the deciduous ones. None were made available in the first report (Ast et al., 1950). In the following year (Ast et al., 195 1) the DF rates per 100 deciduous teeth were given, but only

for children aged five, six, seven and eight years, and in each age group the rates had decreased both in the test and in the control cities.

Unexplained marked decreases in the control. No explanation was given by Ast et al. (1951) for the decreases in the DF rates in Kingston, where the greatest relative decrease, from 32.1 per cent DF to 24.8 per cent DF, was seen in the teeth of the six year-old children. It would have been of great interest to see whether this trend was maintained in later years, but DF rates were not stated in the tables contained in any of the later reports. However, in the following one (Ast and Chase, 1953) the situation in regard to the deciduous teeth of children five, six, seven and eight years old (now termed "def teeth per 100 deciduous teeth present") was depicted diagrammatically by means of a histogram, these unexplained decreases in the def rates in the control city being clearly seen, a small one at age five years, and considerable ones at the ages of six, seven and eight years.

The increase in caries-free teeth in the control. The only other information published regarding the deciduous teeth was expressed in terms of "Children with caries free deciduous cuspids, first and second molars". This type of table appeared first in the 1951 report of Ast et al., and the results were given for only those children who were five or six years of age. In both age groups in Kingston the figures suggest an increase in these caries free teeth, the six-year-old children changing, between 1945-6 and 1949, from 17.2 per cent to 25.5 per cent free from caries. These changes were mentioned, but no attempt was made to explain them. In the next report (Ast and Chase, 1953) data for children aged seven years were also included. This report showed that, between 1945-6 and 1951-2, the percentage of children in Kingston who had these deciduous teeth free from caries showed a slight decrease at age five years (28.2 per cent to 26.4 per cent); but in the six-year old children the percentage increased from 17.2 to 26.3; and in those who were seven years of age, it practically doubled (8.3 to 16.5). On this occasion, these changes in the control city were not even mentioned.

"Analysis" of findings. In the 1955 report of Ast et al. it was stated that "As an indication of the benefits of water fluoridation to deciduous teeth, a previous report [in 1953] analyzed the findings among the 6 to 7 year old children in each city after six to seven years following the initiation of water fluoridation." Actually the report showed findings for the children aged five,

six and seven years who had caries-free deciduous cuspids, first and second deciduous molars. At the ages of six and seven years, in both the test and the control cities, there were increases in the percentages of these teeth that were free from caries; therefore, although these increases were greater in Newburgh, they should not have been attributed solely to water fluoridation. In any case, the publication of one table showing, in this selected group of deciduous teeth, the percentage changes that have just been mentioned, a histogram depicting the def rates, and twenty lines of comment in the text on the results displayed, can hardly be said to indicate the benefits of fluoridation to deciduous teeth, or even to constitute an adequate analysis of the findings in regard to the deciduous teeth present in children aged six and seven years.

Changes in caries-free teeth in the control. In the 1955 report of Ast et al. the age range was changed by not publishing the results for the five-year old children, but showing, for the first time, the results for caries-free deciduous cuspids first and second deciduous molars, for eight and nine-year old children. However, these results cannot be compared with those of the previous years, as they were based on a combined clinical and X-ray examination. Nevertheless, a comparison can be made with the rates shown in the final report (Ast et al., 1956). In the year between the 1953-4 and 1954-5 examinations, the rates in Kingston for the ages six, seven, eight and nine years changed from 10.6, 7.0, 7.9 and 0.0 to 11.1, 4.7, 1.8 and 1.6 for the respective ages. Such changes are not unexpected, for marked variations were seen in Evanston, where, also, the examinations were made by a clinical plus X-ray procedure. For instance, the percentages of children aged seven years who were drinking fluoridated water and who had caries free deciduous teeth were, in successive examinations, 11.33 (pre-fluoridation), 8.71, 3.87, 10,66, 13.01 and 17.86 (Hill et al., 1956). It would seem that assessments made on the basis of caries-free groups of deciduous teeth are not very reliable.

Changes in the sampling method. Consideration of these five dental reports shows that the sampling method changed from time to time, and that the method used in the control city was sometimes the same and sometimes different from that used in the test one. In the first report (Ast et al., 1950) it was stated:

> "we are considering only those children age 6-12 who were in the original base study and who have had each successive examination

> until they reach age 12. Also included are new school children who entered the study at age 6 subsequent to the first examination and were present at each of the successive examinations. Thus, this study group will have only those children who we are assuming have had continuous residence in their respective cities."

Continuous residence only assumed. It can be seen that the "continuous residence" of each subject was based on assumption only, and not on statements made in a questionnaire, such as was used in Evanston (Blayney and Tucker, 1948). Therefore, it is possible that children could have been absent from the city for considerable periods between the times of successive examinations. Also, there is no assurance that the six-year-old children entering the study in any of the post-fluoridation examinations had not come to live in the area since the commencement of the study. Therefore, it is doubtful whether the objective of having "reasonable assurance that the children studied had had continuous residence in their respective cities" (Ast et al., 195 1) can be said to have been attained.

Population changes in Newburgh. "Early in 1950 questionnaires were given to more than 3,200 children in the Newburgh schools for completion by their parents" (Ast et al., 195 1). The questions asked were not stated, nor was the number of replies received, but it was said that:

> "An analysis of the answers to those questionnaires shows that the Newburgh population is a relatively stable one and that the inclusion of the small migrant groups does not alter the caries picture to any significant degree. Consequently, in this report there are included all 5 to 12 year old children present in the schools in Newburgh and Kingston on the days the examinations were made" (Ast et al., 195 1).

Since information in regard to the caries attack rates in these migrant groups could not have been obtained directly from the questionnaires, it is presumed that the dental record cards of those children were grouped and that the cards of the children who were judged from the answers not to be migrants were also grouped, and the data contained in the two groups in regard to the caries attack rates were compared. If that process was carried out, it was not mentioned, nor were data published which would enable the reader to assess the situation. If no differences were found between the two groups, it must be considered to be strange because by that time it was said that "The DMF rates among permanent teeth of 6 to 12 year old children

in Newburgh show a consistent downward trend" (Ast et al., 195 1). The United Kingdom Mission (1953) reported that the authors of this study had "found that the proportion of immigrants in Newburgh and Kingston was too small to affect the comparison." However, although the Newburgh population was said to be "relatively stable", in the 1954-5 examinations in that city 24 per cent of the children were excluded because they failed to fulfil the residence qualifications (Ast et al., 1956).

The workers who conducted the paediatric study in these cities, Schlesinger et al., in 1950 said that in each city "An effort was made to select... children from families which might reasonably be expected to remain for the duration of the study." In spite of that precaution, they found that 29.9 per cent of their subjects in Newburgh moved from the city during the period of the study (Schlesinger, Overton, Chase and Cantwell, 1956).

Population movement in Kingston. No mention was made of the issue of a questionnaire to children in the control city; apparently it was assumed that migrants to that city would have come from areas with "fluoride-free" water supplies. Schlesinger et al. (1956) found that 22.2 per cent of the children included in the paediatric examinations moved from Kingston during the period of the study; presumably a similar number of new residents settled in the city.

It may be considered that in moving from one locality to another, interruptions could occur to regular conservative and prophylactic treatment of the children, so that their dental health may not have been as good as that of children who lived for many years in the same city. It is possible also that regular dental examinations, by stimulating interest in the teeth, may improve eating habits and oral hygiene measures.

Considerable alterations in populations. In Table I of Ast et al. (1950) the number of permanent teeth erupted is shown. The numbers given for Newburgh in the examination of 1944-5 for the three age groups six to seven, eight to nine and ten to twelve years are respectively 3,579, 7,937 and 24,586. However, by adding in Table I of Ast and Chase (1953), the number of erupted teeth - for the same age groups, and in the same examination - are 5,379, 10,033 and 27,186. It was stated in the former report that "we are considering only those children age 6-12 who were in the original base study and who have had each successive examination until they reach age 12." It therefore appears that to meet those requirements, it was necessary

to exclude, for the three age groups, 33 per cent, 21 per cent and 10 per cent of the number of erupted teeth, and, presumably, similar percentages of children. A like situation was seen in regard to the Kingston data, the percentages of teeth excluded being 24, 26 and 12. After only four years, it was apparently necessary to omit these large proportions of the data in order to consider only those children who were "continuous residents", no other explanation being evident for the different numbers of erupted teeth that were stated in the two papers. Although the population of Newburgh may have been "relatively stable" when compared with some unnamed population, it is obvious that the number of migrants was so great that they should have been excluded from the study.

Data of migrants excluded only in Newburgh. The necessity for excluding the data of migrants was later realized, and the method of including in the study all the children present in the schools on the day of the examination - although it was continued in Kingston - was abandoned in Newburgh. Ast et al. (1955) stated: "Based on residence histories, the Newburgh study group was limited to those who had used Newburgh water since the introduction of sodium fluoride on May 2, 1945." In the final report, also, only those children who had lived continuously in Newburgh were included, but "All the Kingston children examined are included in this report" (Ast et al., 1956).

Alterations in sample size. The sample size and the age distribution of the children were altered during the course of this study. The data included in the first three dental reports were obtained from the "entire elementary school populations" (Ast and Chase, 1953), except that in some years some of the children were excluded in Newburgh on residential grounds, and that in 1951-2, owing to the loss of an examiner, only half of the children in each city were included. However, in the 1953-4 series the age range was restricted to six to ten years, and the number of children examined was only a small fraction of those inspected in the same age groups during other examinations. Ast et al. (1956) said that the preceding report "dealt with rather small groups of children (about 375 children ages six to ten in each city), and there was considerable difference in age distribution."

Sampling by selection. The method of sampling used in the 1953-4 examination must be considered to be unorthodox, and was described by Ast et al. (1955) in these words:

> "The current series includes a limited number of schools which were chosen because of the availability of X-ray facilities. From previous data on DMF rates by school, it was determined that the selected Kingston school had a caries rate which was among the lowest in the city, while the rates for the three Newburgh schools were distributed through the range of rates for that city. This has the effect of minimizing the difference in the DMF rates between the two cities."

A decrease in the "per cent difference". In the final report (Ast et al., 1956, Table 1) the "per cent difference" between the DMF rate per 100 erupted teeth of children aged six to nine years in Newburgh and Kingston was given as 56.7. This is a smaller difference than any of those shown for the ages six, seven, eight and nine years (74.7, 68.3, 58.1 and 66.0 respectively), in the previous (1955) report, despite the fact that it was stated in that report, that the sampling method used had minimized the difference between the DMF rates in the two cities. A trial period of ten to twelve years was suggested by Ast (1943), and was mentioned in the authors' first report (Ast et al., 1950). In view of the decrease in the "per cent difference" between the test and the control cities, which was revealed in the final report, it is unfortunate that the trial was stopped as soon as the minimum period proposed by the authors had elapsed.

DISCUSSION

The Expert Committee on Water Fluoridation of the World Health Organization (1958) stated that "Hundreds of controlled fluoridation programmes are now in operation in many countries. Some have been in progress for the past 12 years, so that conclusions are based on experience." This statement suggests that there is a large amount of experimental evidence in regard to the process of artificial fluoridation. It is very doubtful whether this is the case. If hundreds of fluoridation programmes have been conducted with experimental controls, it is strange, and very unfortunate. that such a large body of data has not been published; for, except in the cases of the trials which have been considered here, published data concerning fluoridation trials are very meagre. It would seem, therefore, that the Expert Committee did not use the term "controlled" in its experimental sense, but in that of regulated measurement of the fluoride salt, such as in its statement that "The precision of fluoride application should be carefully controlled."

The United Kingdom Mission (1953) which visited North America in 1952, in its report referred to "the Fluoridation Studies", and enumerated only six study centres; and Jenkins (1955) mentioned "the six study centres on the American continent". In addition to the four test cities which have been considered, the Mission referred to Sheboygan, Wisconsin, and to Marshall, Texas. No control city for Sheboygan was mentioned; and the Mission stated that in the latter study "The neighbouring town of Jacksonville with a fluoride-free water supply was selected as control, but although caries experience in the two areas was compared after 2 1/2 years of fluoridation, the most valuable basis for comparison is the baseline data of Marshall itself." The Mission quoted two unpublished reports as the source of its information in regard to the latter study. An indication of the minor importance of these two trials is the fact that in the 240-page report of the New Zealand Commission of Inquiry (1957) no data from them were presented, the former city being mentioned twice and the latter only once. Furthermore, the directors of these studies, Doctors F A. Bull and E. Taylor, were not named in the report, and the extensive bibliography did not include any papers published by them.

The crucial importance, even at the present time, of the trials conducted

in Newburgh, Grand Rapids, Brantford and Evanston was demonstraled by the report made in 1957 by the New Zealand Commission, the hearings of which did not conclude until April of that year, and by the report of the Expert Committee of the W.H.O. (1958), which met during August 1957. The only evidence mentioned by the Commission with regard to the dental results of the addition of fluorides to water supplies was that obtained in those four cities. The Expert Committee referred to only the first three of those cities in the few lines of its report which mentioned dental results of fluoridation.

In discussing the general design used in fluoridation studies, the United Kingdom Mission (1953) said:

> "In a fluoridation study, two nearby towns, comparable in all respects, are chosen, both having an almost fluoride-free domestic water supply, preferably from the same source. The water of one town is fluoridated while that of the other remains untreated, this town serving as the control. Before fluoridation is started the teeth of the children in both towns are examined in detail to ascertain if caries experience is similar and to determine its prevalence in the various age groups. Further examinations are carried out at yearly intervals and the dental condition of the children in the fluoridated town is compared with that of similar groups in the control town. The prefluoridation data also serve as a basis for comparison. The caries incidence may also be compared with that in a town where a similar concentration of fluoride occurs in the water naturally. In practice it is often difficult to obtain all these conditions and in some studies there is no independent control."

The term "comparable in all respects" describes a theoretical ideal for a test and a control town rather than a practical possibility. In regard to the other matters mentioned in the design these studies exhibited numerous deficiencies. No control was employed in the City Council study in Brantford, and the Grand Rapids study lost its control in 1951 as a result of the fluoridation of the Muskegon water supply. In the extremely important matter of the water supplies, both the source and the composition of the Newburgh water is considerably different from that of Kingston. Further examinations were "carried out at yearly intervals" only in Grand Rapids-Muskegon, and in Newburgh-Kingston until 1952; if yearly examinations were made in the latter study after that year, the results for all years were not

published. In the Evanston trial, only two examinations were made in the control city, and few data from it have been published; in the test city only one age group was examined each year. In Brantford and in Evanston, and in the first and the last dental reports from the Newburgh-Kingston study, data from children of different yearly ages were added, thus introducing the possibility of "weighting". In some instances, at least, the degree of "weighting" found indicated that the comparisons were not being made between similar groups in the test and the control cities. No pre-fluoridation data were gathered in Brantford by the Canadian Department of National Health and Welfare, for that study was not commenced until over two and a half years after the fluoridation of the city water supply.

In all of the studies that have been considered, it has been seen that fluoridation of the water supply of the test city was initiated before the initial caries rates in the control city were known. This late examination of the control cities, on first thought, may not seem to be of much consequence. However, it means that, in all of these studies, a matter of fundamental importance was disregarded-it could not have been established that the children of similar ages in the test and the control cities, prior to the commencement of the experiment, had reasonably comparable caries attack rates. Therefore, the statement of the United Kingdom Mission (1953) that "Before fluoridation is started the teeth of the children in both towns are examined in detail to ascertain if caries experience is similar and to determine its prevalence in the various age groups" appears to have been based on assumptions only.

Caries attack rates may be expressed as decayed, missing and filled teeth per 100 erupted teeth, or expressed as per 100 children or per child. The former method was preferred by the authors of the Newburgh trial "because individual teeth may be subjected independently to the hazard of caries" (Ast et al., 1956). In the Evanston study, the rate per 100 erupted teeth was given, but, curiously, only for children aged twelve to fourteen years. All other cases (the younger children in Evanston, and the other studies) in which the caries attack rates per 100 children or per child were given are based on the assumption, unsupported by published evidence, that in each age group the mean numbers of each category of erupted teeth per 100 children is very similar in the test and the control cities, and that little variation occurs from year to year. If this is not the case, comparisons between the rates prevalent in the test and the control cities, and those seen in different years, are not valid. Feltman (1956) gave fluorides—in tablet form—to pregnant women

and young children, and reported that "Many children in the study group showed a marked delay in the eruption of the deciduous teeth. This delay is in some instances a cause for alarm by the parents. The second incisor, second molars, and cuspids are the most frequently delayed, in many cases by as much as a year from the accepted average eruption dates." Of course, if fluoridation results in the eruption rate of teeth being retarded, a decrease in caries experience would be expected due to the shorter time of exposure of the teeth to the risk of caries. It will be recalled that data were published in the Evanston study which were compatible with a continuous and marked decline in the rate of eruption of first permanent molars during the first four to five years of fluoridation, but that further comparisons could not be made because this type of data was not published for younger children in later reports.

In order to decrease the chance of misinterpretation, extensive use has been made of direct quotation from the original reports, and to avoid unnecessary repetition, consideration of the comments made on the results reported from these control cities, apart from those made by the authors of these studies, has been restricted to the statements of only a few writers.

It is felt that it is not necessary to discuss further the matters which have been noted above, for they are self-explanatory. It has been shown that the reports of the controls used in these fluoridation trials contain arithmetical and statistical errors, and that results and relevant data were omitted. Also, misleading statements were made which denied, ignored, or underrated the unexplained changes in caries attack rates which took place in the control cities, and which suggested that the pre-fluoridation data from the test cities, and those obtained during the basic examinations in control ones, were more closely comparable than was the case. Jean R. Forrest, the Senior Dental Officer, Ministry of Health, who was a member of the United Kingdom Mission and of the Expert Committee on Water Fluoridation of the World Health Organization, in 1957 contrasted "the emotional type of opposition" to fluoridation, to "the precise correct statements of scientists," However, the situation which has been encountered is more aptly described by the words of Wade Hampton Frost "an outstanding American epidemiologist" (Bews, 1951). More than thirty years ago Frost (1925) said:

"It is frequently easy to exhibit some figures which, though not

> really to the point, will nevertheless serve to impress an uncritical public, and the temptation may be great to give them, at least by implication, an unduly favourable interpretation. It is more difficult and more tedious to present the full argument, based on all the facts, and it is perhaps a little humiliating to admit that the statistical evidence is deficient because we have failed to collect it; but to do this is not only more scientific, it is in the end more convincing, and after all there is no free choice, because it is the only honest method, whether it be convenient or not. Finally, it is the only way of progress, for the first step towards collecting better evidence is to recognize the deficiencies of that which is at hand."

More than eleven years after the initiation of the last of these five trials, the deficiencies of their controls still remain unrecognized. The endorsements of fluoridation by medical and dental associations, by public health authorities, and even the recent one by the Expert Committee on Water Fluoridation of the World Health Organization (1958), appear to have been based mainly on the opinions of the authors and of others. Indeed, in the report of that Committee, under the heading "Results of fluoridation", instead of results being considered, comment was confined to: "Reports of the results after 10 years of controlled fluoridation in three cities". Examinations of the data obtained in these trials, which have been published by other endorsing bodies, are also inadequate or absent. It is an understatement to term this failure regrettable.

In 1951, Appleton stated that in any future fluoridation trial: "The experiment should be genuine, and not one in name only. In designing such an experiment, a careful and competent analysis of those now in progress should first be made, in order to see how they might be improved or extended."

In the early part of this paper some basic experimental considerations were mentioned. In cities in which it is intended to compare the caries attack rates of the children in a fluoridation trial, the three main factors which should be as closely comparable as is practically convenient are the composition of the water supply, the climate and the dental caries attack rates. Four trials having "fluoride-free" control cities have been considered. The composition

of Newburgh's water supply is considerably different from that of its control city. There were gross differences between Evanston and its control city regarding the initial caries attack rates in the younger children. In the Department of National Health and Welfare study in Brantford, as the first examination was made over two and a half years after the commencement of fluoridation, it cannot be known what the pre-fluoridation rates in that city would have been, if assessed by those examiners; thus, it cannot be determined how closely the (1945) Brantford rates resembled those of Sarnia. In the Grand Rapids study, the fluoridation of the water supply of Muskegon in 1951 severely limited its usefulness as the control city.

In each trial both the test city and its control were selected. For instance, "Oak Park graciously offered to serve as the control community" for Evanston (Blayney and Tucker, 1948). Two cities which had agreed to participate in the experiment, after having been found suitable for comparison, should have been allotted at random to be test or control. It will be recalled that in at least two of the cities selected as test ones, Evanston and Brantford, "dental care was outstandingly good" (United Kingdom Mission, 1953)

It has been pointed out in Part One that in all these trials no attempt was made to devise a randomization procedure in the clinical examinations which would have eliminated examiner bias, nor were estimates made of examiner variability.

Two statements made by authors of these studies may be recalled. In 1950 Hill et al. said: "It is to be expected that the rate of caries in all teeth varies from year to year due to chance. A significant reduction of caries prevalence can therefore be assumed to exist only when the statistical analysis of the data provides almost absolute certainty that the observed differences are not due to chance." However, as was mentioned in Part One this very important matter of random variation has been ignored in all these studies. Blayney and Tucker (1948) stated that: "A study of this nature must have an adequate control." It has been seen that the controls used in these trials cannot be considered to be adequate.

It would Appear that these shortcomings have not been recognized, for those who conducted these studies, and other writers, have expressed their satisfaction with the methods used. For instance, Ast and Chase, the authors of the 1953 report on the Newburgh-Kingston study, referred to "the carefully controlled studies such as the Newburgh-Kingston, Grand

Rapids-Muskegon, and the Evanston studies"; and Mather (1957) said: "This study at Brantford was most carefully set up and has been under the strictest control."

Approval of the methods used in these studies was also expressed by the New Zealand Commission of Inquiry (1957), for it considered that: "All these investigations" in Brantford, Newburgh and Grand Rapids "were designed and executed with great thoroughness." The Commission also said: "We have examined the statistical evidence brought forward by the advocates of fluoridation, and the conclusions they have drawn from that material ... We have found nothing to invalidate the statistics or cast doubt on their reliability." It will be realized that many of the deficiencies of these studies can be noted only when different reports >from the same study are compared. It seems that the Commission was handicapped in this regard, for although its "List of exhibits produced at public hearings" mentions over 250 items, such as papers, books, charts and letters, it includes only the final report, or the one which was the most recently published at that time, of the numerous reports showing the dental caries attack rates which were published in each of these studies. It would appear that none of the earlier accounts of these trials were shown to the Commission, nor were they mentioned in the "bibliography" of 144 references. None of the reports from the City Health Department trial in Brantford were listed as exhibits. The paper by Brown, Kohli, Macdonald and McLaren (1954a) which is mentioned deals only with gingival results. Although the Commission had the assistance of legal counsel in gathering the evidence, no mention was made of the employment of a statistician to assist its members in evaluating the numerical data.

The Expert Committee on Water Fluoridation of the World Health Organization (1958) also expressed its satisfaction with the methods used in these trials. Out of the hundreds of controlled fluoridation programmes which it stated have been set up, it mentioned only the Newburgh, Grand Rapids and Brantford (City Health Department) studies in the sixteen lines which allotted to the mention, one cannot say consideration, of the results of fluoridation on dental caries prevalence. Presumably these three trials were cited because the Committee considered that they were the most important and reliable studies, and it said that they were "carefully planned and controlled". As this opinion of the Committee was made in referring to the three studies which it cited in mentioning results of fluoridation, it is

reasonable to assume, at least in this instance, that the term "controlled" was used in its experimental sense.

If this is the case, the inaccuracy of that statement of the Expert Committee is astonishing, for it will be recalled that, of the three studies which the Committee quoted, the Brantford (City Health Department) study, far from being carefully controlled, was not controlled at all. Furthermore, the control for the Grand Rapids study was abandoned after only six years, at the crucial stage of the trial when the first of the permanent teeth were erupting in the children of the test city who had ingested fluoridated water throughout their lives. Therefore the control, was abandoned before any assessment of caries activity in those teeth could be made. In regard to the remaining study mentioned by the Expert Committee, the Newburgh trial, after the unexplained decreases in the DF rates for deciduous teeth, which were shown as having occurred in Kingston, the control city, between 1945-6 and 1949, no further caries rates for deciduous teeth were published. Also, the erratic changes which were made in the methods used in this trial are not consistent with careful planning, nor is the choice as the test and control areas of two cities with water supplies which were of considerably different composition.

It has been acknowledged for many years that one of the fundamental procedures in planning an experiment is the establishment of a statistical design for the procedures before work is commenced. The deficiencies in the basic statistical requirements of a good experimental design are only too obvious in all these studies. Therefore, it is surprising that the Expert Committee did not point out these deficiencies, but, on the contrary, described the three studies which it mentioned as carefully planned ones. The importance of these matters is emphasized by the authoritative statement of Fisher (1951) that: "If the design of an experiment is faulty, any method of interpretation which makes it out to be decisive must be faulty too."

This investigation of reports of these fluoridation trials was instituted when a preliminary examination of the methods used revealed disturbing facts, and solely because it was felt that, as Appleton (195 1) expressed it: "Professionals and specialists have the duty of insisting upon a scientific demonstration of a high probability that a proposed method will be useful and safe, before it is recommended for general adoption. The maintenance of this attitude is of paramount importance."

The deficiencies of these trials not having been recognized, many cities

have already fluoridated their water supplies on advice which is based largely on the results that have been considered. It is, therefore, an important and urgent matter that a more accurate assessment of the efficacy of this process should be obtained, but, unfortunately, it appears that little long-term experimental evidence is available. Therefore, despite the limitations imposed by the methods used in these studies, consideration should be given to a careful and competent examination of the whole of the original data obtained in them. The findings resulting from such an examination would be of assistance in designing future fluoridation trials, and would provide a far more adequate assessment of the results reported from these studies than it is possible to obtain from an examination of the very limited data that have been published.

At least until such a report is available for examination, it would be wise to maintain an open mind in regard to the efficacy of artificial fluoridation.

SUMMARY

1. Endorsements of the process of the mechanical fluoridation of public water supplies rely mainly on five experimental trials.

2. The controls used in these studies are considered.

3. The reliability of the results reported is affected by:

   (a) odd experimental and statistical methods;
   (b) failure to consider random variation and examiner variability, and to eliminate examiner bias;

   (c) omission of relevant data;

   (d) arithmetical errors;

   (e) misleading comments.

4. Controls were either doubtful or inadequate.

5. No control was employed in one trial.

6. The published data do not justify the statement that caries rates remained the same in control cities.

7. The sound basis on which the efficacy of a public health measure must be assessed is not provided by these five crucial trials.

PART THREE

CRITICISMS AND COMMENTS

Soon after the publication of the first edition of this monograph in September 1959, the author was informed by Dr K. T. Adamson, President of the Australian Dental Association, that copies had been sent to "all of the men who are in charge of the experiments" asking them for comments (personal communication). As a result the reviews published in the February 1960 issue of the Australian Dental Journal were contributed by Dr Donald Galagan, Dr J. R. Blayney and Dr I. N. Hill, and by Dr R. M. Grainger. The review in the New Zealand Dental Journal of January 1960 was written by Mr J. Ferris Fuller.

The aim of this monograph is to attempt to clarify some aspects of five crucial trials of artificial fluoridation, those conducted in Grand Rapids, Evanston, and Newburgh, U.S.A., and the two trials held in Brantford, Canada. Therefore, in this part, all these critical reviews will be quoted in full; and comments will be made on the points raised and indicated by the figures in brackets.

In order to allow the reader to appraise the criticisms more easily it will be necessary to refer to the statements made in the text, therefore page references are indicated for Parts One and Two of this volume.

DR DONALD GALAGAN

The first review of this book in the *Australian Dental Journal*, by Dr Donald Galagan, Assistant Chief, Division of Dental Public Health, Public Health Service, Washington 25, D.C., was as follows:

My comments will be limited to the general qualities of Dr Sutton's treatise and the conclusions he has reached. Individuals associated with the several fluoridation projects which he has purported to "analyse" will have provided their specific reactions to his "analysis" of their findings.

Although it is nothing new to see an accredited scientist mix fact and fancy, near truth with truth, and emotion with reason it is always shocking to realise that an intelligent individual in a responsible position can so baldly misinterpret scientific data. Actually, it would be extremely difficult for an objective scientist who knows anything at all about the data characterizing the relationship between dental caries and exposure to fluorides to reach the conclusion that the effectiveness of controlled water fluoridation in reducing dental caries has not been proved. This conclusion could only be reached by an armchair statistician who has chosen to ignore or does not know the great mass of information on the subject.

Thus, first and foremost among the *fundamental* errors(1) which Dr Sutton makes is expressed in the statement in the second paragraph of the monograph which says that "proposals to fluoridate domestic water are almost entirely based on the results of the Brantford, Grand Rapids, Newburgh, and Evanston projects". Using this premise, the balance of the document is devoted to efforts to describe "errors and omissions" in these four projects. These errors are supposed to negate the whole fluoride-caries hypotheses(2), or at least to throw serious doubt on the fluoridation of water as a caries preventive.

Actually, the scientific basis on which this public health measure rests was established solidly before any of the above mentioned projects were started. The preventive effect of long term exposure to water-borne fluoride on caries experience was observed in literally thousands of children residing in many different communities where the water consumed had picked up the element as it coursed over or through the earth's crust. The long series of investigations documenting the relationship are considered to be classic examples of good epidemiological method(3) - so much so that they are used as case studies in teaching the science of epidemiology in our schools of public health.

The fact is that the projects at Brantford, Grand Rapids, Newburgh and Evanston were designed primarily to evaluate the technical, financial and administrative problems associated with the controlled addition of fluorides to a municipal water supply, and, secondarily, to demonstrate the effectiveness of the procedure(4) to the profession and the public. To be sure, it was necessary to show that the procedure would reduce the caries attack rate in resident children, but as soon as the trend toward reduction was observed and corroborated, the "experimental" portions of the projects were completed for all practical purposes. The principal point, however, is that these projects emphatically are not the sole basis on which the widespread use (in the United States) of this procedure rests(5).

In short, it is preposterous to attempt to conclude that the basis for community water fluoridation is faulty because of some real or imaginary defects in the planning, execution and evaluation of data from the four community projects. The contents of the monograph, therefore, represent no more than an exercise in semantic and scientific dilettantism designed to serve some other purpose.

There are a good many other specific, but less important errors in judgment which the author has made, such as his suggestion that the variability of examiners in diagnosing dental caries has been overlooked(6). The truth is that this variability is well known, and is discussed at length by specialists in the fields of epidemiology and caries diagnosis. Because of this "human error" calibration of examiners is practised as a matter of course. Calibration reduces the variability among examiners, but even if it did not, the difference between the caries experience of children exposed and not exposed to fluoride is so great that even Dr Sutton could recognise it(7).

There are several other examples of errors of judgment in the arguments contained in the monograph, indicating the author's serious lack of understanding of the principles of statistics and epidemiology. For instance, the rather amateurish interpretation of adequate community "controls" for evaluating the effect of fluoride-bearing water on caries indicates that the author does not really know the manner in which caries occurs in a population(8).

The author's use of innuendo to make a point is contained in his reference to some very questionable work of Feltman which indicated that the eruption of deciduous teeth might occur later in children exposed to fluorides. The author implies that it is likely that retarded tooth eruption in the children

residing in the fluoride communities reduces their exposure to caries attack, and thus their caries rate naturally is lower(9). Had Dr Sutton been familiar with the literature, he would have known that this was one of the first possibilities thought responsible for the low caries rate in children exposed to fluoride-bearing water (10). He would have known about the rather exhaustive report of Short on the relation between fluoride in domestic waters and tooth eruption which showed that fluoride in concentrations around the optimum used for caries control does not influence the eruption pattern of permanent teeth (11).

However, one suspects that further analysis of the details contained in the monograph will not yield much of value. From reading the document and from hearing him present part of it as a paper last February at your Adelaide Congress, I can only conclude that Dr Sutton has an intense and emotional drive to oppose fluoridation. Why he feels this way is not clear, but it seems likely to come from some motive other than a sincere concern for the statistical or scientific validity of the concept(12).

Commentary on the Review by Dr Donald Galagan

(1) Dr Galagan makes the charge that the "first and foremost among the fundamental errors" was made in the second paragraph of the monograph (p. 136). This paragraph stated: "Apart from these considerations, an examination reveals that there are aspects that call for a very careful appraisal of the figures presented in the reports of the experimental trials which have been conducted in Brantford, Canada, and in Grand Rapids, Newburgh and Evanston, U.S.A., and upon the results of which proposals to fluoridate domestic water are almost entirely based."

Such proposals are based on two different sets of results- those reported from areas where fluorides occur naturally in the water supplies, and those from trials of the mechanical addition of fluorides to waters in which the fluoride content is very low or absent. The former reports are not considered in this investigation, but Dr Galagan says that they were gathered in such a way that they "are considered to be classic examples of good epidemiological method". In any case, they are of practical importance only if it is known that the results reported will be obtained when commercially available fluorides are mechanically added to water supplies.

This knowledge can be obtained only by the use of experimental trials—the

results of which must then be considered to be of outstanding importance—unless it is accepted that it can be established, on theoretical grounds, that the results of artificial fluoridation will be identical with those seen in areas where fluorides are found naturally. If the latter case is accepted, the early artificial schemes which are considered here were held merely, as Dr Galagan suggests, "to demonstrate the effectiveness of the procedure" and cannot be considered to be true experimental trials.

The question to be answered is this: Were these trials mere demonstrations or were they set up as genuine experimental studies? If they were only demonstrations Dr Galagan's charge is justified, but if these trials were conducted to determine the outcome of the process of mechanical fluoridation, then his accusation is without foundation and must be discredited.

In 1951 a report was issued by the ad hoc Committee on Fluoridation of Water Supplies of the National (U.S.A.) Academy of Sciences, National Research Council (Maxcy, Appleton, Bibby, Dean, Harvey, Heyroth, Johnson, Whittaker and Wolman, 1952). One of the members of this Committee was Dr H. Trendley Dean, who was closely associated with much of the earlier work concerning fluorides and was, at that time, the Director of the National Institute of Dental Research. The report included this statement: "In 1945, studies were begun to ascertain whether the adjustment of the fluoride content of a public water supply to the optimal level with commercially available fluorides would confer the same caries-inhibitory effects as do waters which carry the same concentrations of fluoride naturally."

This statement makes it clear that Dr Galagan's contention, that these trials were only demonstrations, is not correct. However, because of the importance of this matter and in case it is suggested that that Committee was misinformed concerning the intention of these trials, a quotation will be given from each of the five studies considered. Dr Galagan calls the process used in these test cities "the controlled addition of fluorides to a municipal water supply", but the original term used by Dean et al. (1950) and by Brown (1951, 1952), "artificially fluoridated" drinking water, is preferable as it is free from ambiguity (p 63).

The quotations from the five trials are as follows:

(a) Brantford, City Health Department Study, Hutton et al., (1951): "It was recognized that fluorine in the public water supply was not a proven method

for the prevention of dental caries, and that it might take ten years to prove or disprove its preventive value."

(b) Brantford, National Health and Welfare Study, Brown et al., (1954b): "The Brantford Fluoridation Caries Study was undertaken with a view to finding out whether or not the raising of the fluoride content of a previously fluoride-free water supply to part per million, by the mechanical addition of sodium fluoride, would reduce the incidence of dental caries to that which obtains where water supplies derive about 1 part per million of fluoride from deposits in the earth"

(c) Grand Rapids, Dean et al. (1950): "In 1945, three studies to determine the caries prophylactic value of artificially fluoridated drinking water were started in the United States and Canada."

(d) Newburgh, Ast et al. (1950): "In 1943 it was proposed to determine whether we can translate the conclusions derived from the epidemiological studies in fluoride areas to a practical application in fluoride-free areas where the communal water supplies may lend themselves to treatment."

(e) Evanston, Blayney and Tucker (1948): "After further deliberation of the project, both professional groups recommended to the Commissioner of Health that a carefully controlled study be developed to determine whether or not the addition of fluorine in minute quantities to the communal water supply would reduce the incidence of dental caries in Evanston and Skokie children." Blayney and Tucker (1948) also said: "It was carefully explained to these Evanston citizens that nothing could be promised regarding the ultimate value in the control of tooth decay; that if such a program was to be undertaken it must be in the nature of an exhaustive study; and that it would be several years before data would be available which would even indicate the trend which we might expect."

These statements, by the authors of all of the five studies considered, establish beyond question that in every case the studies were not designed "to *demonstrate* the effectiveness of the procedure" but to determine whether or not artificial fluoridation would be efficacious. Therefore Dr Galagan's opinion is incorrect, and the statement made in Part One, which he termed the "first and foremost among the *fundamental* errors", is a correct description of the situation.

(2) His suggestion that an attempt has been made to "negate the whole '' fluoride-caries hypotheses" is without foundation. The only reference to this matter is contained in the quotation of a statement. made in 1949, by the American Water Works Association regarding the experimental verification of "the fluoride-dental caries hypothesis" - that is, to the "fluoridation hypothesis". Statements made in the preface to the first edition and on the first page of Part One and the first and last pages of Part Two show that consideration has been given only to five experimental trials of artificial fluoridation produced by mechanical means. The data from epidemiological studies in "naturally fluoridated" areas, on which the fluorine-dental caries hypothesis is based, have not been considered.

(5) Dr Galagan states that "The principal point, however, is that these projects emphatically are not the sole basis on which the widespread use (in the United States) of this procedure rests." It can be seen, by reading the "free" quotation from paragraph two, page 136, given by this reviewer (1) and pages 140, 189, 190 and 196, that the word "sole" was not used nor implied.

No comment can be made on the other "*fundamental* errors" which Dr Galagan says (1) are present-for he has neglected to state their nature. Instead he continues:

(6) There are a good many other specific, but less important errors in judgment which the author has made, such as his suggestion that the variability of examiners in diagnosing dental caries has been overlooked.

Comment. This suggestion was not made. As Dr Galagan points out in his next sentence (7), "this variability is well known". Therefore it is most unlikely that such a matter would be "overlooked" in studies employing statisticians. Indeed, attention was drawn, on page 180, to the fact that the importance of examiner variability was recognized by Ast et al. in 1950. However, in conducting the clinical examinations, in all the studies considered, this matter was ignored. Therefore, when speaking of this phenomenon, terms such as "not assessed" and "not estimated" were used.

(7) The truth is that this variability is well known, and is discussed at length by specialists in the fields of epidemiology and caries diagnosis. Because of this "human error" calibration of examiners

is practised as a matter of course. Calibration reduces the variability among examiners, but even if it did not, the difference between the caries experience of children exposed and not exposed to fluoride is so great that even Dr Sutton could recognise it.

Comment. As Dr Galagan says, this (examiner) variability is well known. It is precisely this fact that makes it so surprising that this factor was not assessed in these studies. It will be recalled that reference was made, on page nine, to two papers which investigated the matter of examiner variability in caries diagnosis.

The claim is made by the reviewer that "Calibration reduces the variability among examiners", but he does not suggest that this process eliminates between-examiner variability—therefore it should have been taken into account. Of course, the use of the method of the "calibration" of the subjective judgment of several examiners with the subjective judgment of another is, to say the least, a poor substitute for a standard rigorous statistical procedure.

(8) There are several other examples of errors of judgment in the arguments contained in the monograph, indicating the author's serious lack of understanding of the principles of statistics and epidemiology. For instance, the rather amateurish interpretation of adequate community "controls" for evaluating the effect of fluoride-bearing water on caries indicates that the author does not really know the manner in which caries occurs in a population.

Comment. The question may be asked: Who does?

(9) The author's use of innuendo to make a point is contained in his reference to some very questionable work of Feldman (p. 192) which indicated that the eruption of deciduous teeth might occur later in children exposed to fluorides. The author implies that it is likely that retarded tooth eruption in the children residing in the fluoride communities reduces their exposure to caries attack, and thus their caries rate naturally is lower.

Comment. On page 192, reference was not made to the work; of Feldman but to that of Dr Reuben Feltman who was an associate of Doctors D. E. Gardner and F. A. Smith, whose publications on fluorides are well known, and of Doctors H. C. Hodge and D. E. Overton, who were closely associated with the Newburgh trial (Gardner, Smith, Hodge, Overton and Feltman,

1952). Dr Feltman's earlier (1951) work with fluoride tablets was referred to by the New Zealand Commission of Inquiry (1957) as "promising". His 1956 paper, which was quoted (p.192), was a brief "progress report" only. Therefore the results mentioned in it were treated with reserve, the statement being made that "Of course, if fluoridation results in the eruption rate of teeth being retarded ....".

(10) Had Dr Sutton been familiar with the literature, he would have known that this was one of the first possibilities thought responsible for the low caries rate in children exposed to fluoride-bearing water.

Comment. Dr Galagan has avoided the main point which was discussed in this paragraph. His insistence that one of the first possibilities considered was that the ingestion of fluoride-bearing water may retard tooth eruption, makes it even more strange that in only the Newburgh-Kingston study was mention made that this important matter had been investigated. Even in that trial, the only study of tooth eruption rate published was conducted after four years of fluoridation (Ast et al., 1951) in children who were six to twelve years of age, so that none of the subjects studied had been ingesting artificially fluoridated water throughout their lives.

(11) He would have known about the rather exhaustive report of Short on the relation between fluoride in domestic waters and tooth eruption which showed that fluoride in concentrations around the optimum used for caries control does not influence the eruption pattern of permanent teeth.

Comment. It is highly probable that Dr Galagan is referring to the paper by E. M. Short (1944) which is well known to those interested in fluorides, for this is the only paper concerning fluorides and tooth eruption listed under that name in the *Index to Dental Literature in the English Language* (published by the American Dental Association), the *Quarterly Cumulative Index Medicus* (to December 1956), or the issues of the Current List of Medical Literature which cover the subsequent period.

This "rather exhaustive report of Short" does not show whether or not the ingestion of fluorides at the "optimum" level has any influence on the eruption pattern of permanent teeth. This report was made on "selected 12-14 year old white school children" (Short, 1944) in whom almost all the permanent teeth had erupted. The data deal only with the total number of erupted permanent teeth and, despite Dr Galagan's remark, do not give any

information regarding their eruption pattern—a factor which could be of considerable importance in the development of the DMF rate. Short's Tables II and III show that, in all except three of the 4,453 children examined, at least twelve of the permanent teeth had erupted, the minimum number of erupted permanent teeth, for the remaining three children, being ten. His Table I (which excluded third molars) shows that, out of the possible twenty-eight teeth, the mean number of erupted permanent teeth per child in the various cities was between 25.22 and 26.81. In fact, in fifty-five per cent of the children all of the twenty-eight teeth had erupted.

Therefore, this study of Short (1944) gives no information regarding the ages at which the first ten permanent teeth erupted in these children, certainly none regarding the first permanent molars which, presumably, even in the youngest of these children, erupted about five or six years prior to the study. These molars are of outstanding importance in regard to the DMF rate, particularly in young children. Ast et al. (1956) said: "The first permanent molars are frequently used as an index of caries experience among children because this tooth accounts for the major incidence of caries in this group."

It should be noted that neither Dr Galagan nor (as will be seen in their review of this book) Doctors Blayney and Hill, authors of the Evanston study, have commented on the suggestion of a decline in the eruption rate of first permanent molars in Evanston, between 1946 and 1951, which followed the introduction of fluoridation and which is depicted in Figure 4 (p. 27). Neither have they explained why, after 1951, whilst continuing to publish this type of data for the older children, they ceased publishing it for the younger

(12) However, one suspects that further analysis of the details contained in the monograph will not yield much of value. From reading the document and from hearing him present part of it as a paper last February at your Adelaide Congress, I can only conclude that Dr Sutton has an intense and emotional drive to oppose fluoridation. Why he feels this way is not clear, but it seems likely to come from some motive other than a sincere concern for the statistical or scientific validity of the concept.

Comment. Dr Galagan's questioning of the motive behind this study should be considered in relation to statements which he made during his lecture to the Adelaide Congress (Galagan, 1959). He called those who questioned

fluoridation "the opposition" and said that this group "seems to be composed of four distinct kinds of people." These he termed: "the hatemonger, the pseudo-health believer, and the person who opposes fluoridation for personal notoriety" and "the fourth, or rugged individualist, group". As these are Dr Galagan's views, it is not surprising that he doubts the sincerity of this attempt to investigate "the statistical or scientific validity" of these fluoridation findings.

DR J. R. BLAYNEY and DR I. N. HILL

The second review of this book in the *Australian Dental Journal*, by DR J. R. BLAYNEY, Director, Dental Caries Study, Evanston, and DR I. N. HILL, Zoller Memorial Dental Clinic, University of Chicago, was as follows:

Dr Sutton has much to say regarding the lack of comparability(13) of the study and the control areas and the manner of selection of the children in each area to be examined. Oak Park is the suburb immediately to the west of Chicago and Evanston lies immediately to the north. Each community draws its water supply from Lake Michigan. Standard analyses for composition of the water are frequently run. A spectro-chemical analysis for 26 trace elements has been run on Lake Michigan water for a comparison of a similar analysis of water obtained from fluoride areas (unpublished data). Oak Park and Evanston receive their food from the same wholesale markets, each is chiefly residential and free from heavy industry. Each is composed of the same socio-economic level, as borne out by the United States census of population for 1950. In Evanston, 47,395 persons 21 years or over were native born. In Oak Park the figure was 42,454. In Evanston there were 6,049 foreign born persons 21 years or older while in Oak Park the figure was 5,081. In Evanston 41.2 per cent of the occupied dwelling units were owner occupied. In Oak Park 50.8 per cent were occupied by the owner. The median value of a one dwelling unit structure in Evenston was 19,499 dollars and in Oak Park the value was 16,259 dollars. The median value of gross monthly rentals in renter occupied dwelling units in Evanston was 72.53 dollars while in Oak Park the median value was 66.86 dollars. Both areas have comparable, climatic conditions and both are subjected to the same radio and television commercials regarding oral hygiene and dentifrices. Finally, the majority of the dental practitioners in the study and control areas are graduates of one of the three Chicago dental colleges.

For the baseline examination in Evanston we were committed to examine all school children within the selected age range regardless of the length of time they had resided in Evanston. Although an effort was made to include them, the Oak Park Parochial Schools did not find it convenient for us to examine their pupils(14). When we compared the caries prevalence rates of the two towns we found a difference. It is indeed fortunate that our records showed the school that each child attended. In this manner we could first eliminate the Parochial School group and then the Negro group from the total Evanston data. It is well known that coloured people have less dental

caries than whites living in the same population centres(15). The caries rates for the Evanston and Oak Park Public School white children compared favourably(16). All of this clearly indicates how hidden variables may exist in areas which otherwise appear to be comparable, and how important it is to be certain that comparisons are made between like groups(17).

Dr Sutton expressed astonishment that in 1955 the six and seven-year-old Evanston children had a lower caries prevalence rate than the Aurora children of like ages. We, likewise, did not anticipate this. However, the same critical evaluation both clinical and roentgenological, was made of every case. This difference was due to something other than fluoride. Possibly the presence of the dental team in the school, year after year, has stimulated the classroom teachers and the school nurses to place more emphasis on the teaching of oral health. Some unknown hidden variation not related to fluorides must account for the difference(18).

Dr Sutton was concerned that the control group was not examined annually. Neither we nor our advisers could see a reason to require an examination of the control group other than at the beginning and near the close of the study. This provides the baseline from which to measure the trend of the dental caries rate during the time interval (1947-1956). Should the rate in the last examination (1956) deviate materially from that of the initial baseline period (1947) that figure could be used as a correction factor on the Evanston findings. In fact, if we had not desired to measure the yearly decrement in the rate of dental caries under fluoridation and evaluate other factors only two examinations in Evanston would have been necessary, the first in 1946 (before fluoridation), the second and final in 1961(19).

Much has been made of the variations reported in the number of children examined. The baseline examination of 4,375 Evanston children and of 2,493 Oak Park children are correct. However, the data from those children who had not used Lake Michigan water all of their lives had to be excluded. It was also observed that some children below the age of 67 months and above the maximum of 174 months had been examined. Therefore these out of range children were not considered in the final determination of the caries rates. This explains the discrepancy between the Evanston 4,375 and 3,692 and the Oak Park 2,493 - 2,051 figures(20). It should be noted that when dental caries experience rates were compared, the same number of examinations, that is 1,991 for the six to eight-year-old children and 1,701 for the 12 to 14-year-old children, were used throughout the reports for

the combined Evanston school groups (Public White, Parochial and Public Negro)(21). Dr Sutton on p. 167 of his report (fig. 5, Statement C) calls attention to Evanston Dental Caries Study Report Number XVII. Here he points out that only 1,754 six to eight-year-old children and 1,556 12 to 14-yearold children were listed. This particular report was primarily concerned with differences in sex and race, as they influenced caries, rather than the effect of fluorides. Therefore a comparison was made of the dental caries experience rates of white girls to white boys; Negro girls to Negro boys; white girls to Negro girls; white boys to Negro boys; and white children as a group to Negro children as a group. The children were classified into male white, female white, male Negro and female Negro for comparison(22). As Dr Sutton calls attention to the difference in the number of examinations made in this report when compared with other reports, we wish to point out, in explanation, that it was necessary to not only insure that children of correct age be included but also it was necessary that every examination be clearly classified according to race and sex There were 236 six to eight-year-old children and 245 12 to 14-year-old children excluded from this report because they did not fulfil the requirements for this comparison. These children were included in other reports as no distinction except age was made(23). It is also pointed out that this report, Evanston No. XVII as noted above, was primarily concerned with comparison of the caries rates of the coloured and white children and not with the effect of fluoridation on dental caries rates. Therefore in this light, this report, No. XVII, should not have been listed under the general heading of fluoridation as Dr Sutton has it listed in his critique(24).

It is true that a discrepancy in figures published in our paper XVI, Table I and in paper XVIII, Table I are at variance. This is due to the operator of the tabulating machine providing the wrong figures for the number of seven and eight-year-old children examined. This error was discovered after manuscript XVI was in press and therefore the corrections could only be made manually in the reprints supplied to readers who requested them(25).

Commentary on the Review by
Dr J. R. Blaynex and Dr L N. Hill

(13) Reference to Part Two will show that no suggestion was made in it that there was a “lack of comparability” between Evanston and Oak Park; it was merely pointed out that the manner in which Oak Park resembled Evanston

was not stated (p. 16). Therefore this detailed exposition of the similarity of the two cities is welcome, although it is unfortunate that, when speaking of rental and dwelling values, the "mean" values were not given as well as the "median" ones. It will be realized that the housing picture may be very different in two towns and yet the "median" (that is, the middle) values of the rentals and dwellings can be the same. In view of the data shown here, regarding housing and the training of the dentists, it is surprising that the members of the United Kingdom Mission (1953) should have singled out Evanston for comment, remarking on its high economic level and its "outstandingly good" dental care (p. 149).

These data also show how reasonable was the assumption of Dr Blayney before assessing the caries rates in Oak Park-that that city was "the ideal control community" for Evanston (Blayney and Tucker, 1948;). They also emphasize how strange it is that such gross differences should be found between the initial caries rates of the children aged six to eight years in the two cities, and reported-after a delay of ten years-by these workers (p. 153; Fig. 3, p. 154). The fact that such gross differences can be found in the caries rates prevalent in two cities which were so similar that one was termed "the ideal control community" for the other (Blayney and Tucker, 1948), confirms the necessity for pre-fluoridation examinations in both test and control cities. Unfortunately, as pointed out in Part Two this was not done in any of these studies.

(14) For the baseline examination in Evanston we were committed to examine all school children within the selected age range, regardless of the length of time they had resided in Evanston. Although an effort was made to include them the Oak Park Parochial Schools did not ford it convenient for us to examine their pupils.

Comment. The latter remark is welcome for it explains the absence of data from the parochial schools in Oak Park.

(15) When we compared the caries prevalence rates of the two towns we found a difference. It is indeed fortunate that our records showed the school that each child attended. In this manner we could first eliminate the Parochial School group and then the Negro group from the total Evanston data. It is well known that coloured people have less dental caries than whites living in the same population centres.

Comment. Despite their statement that "It is well knowp that coloured people have less dental caries than whites living in the same population centres",

when conducting the initial examination in Evanston the authors combined the data of the Negro children with those of the white children. It is now clear, as deduced on page eighteen, that the racial and school groups were taken into account only after it was found that there was "a lower caries rate for school children of the control area" (Hill et al., 1951). Thereafter, when comparing the test and control cities, the data of both the Negro and the parochial school children were excluded from the Evanston data. No reason has been given for this exclusion of the data of parochial school children in Evanston-who had a high caries rate (Hill et al.) - from the data of the main body of white children in that city. This could not be attributed to the fording of a similarly high caries rate in the parochial school children in the control city of Oak Park for they were not examined and, therefore, their caries rates were unknown (see 14).

Neither has an explanation been offered for the extraordinary reversal of this policy (the exclusion of the data of Negro and parochial school children in Evanston) when compiling the XVIII Report (Hill et al., 1958). This report published, for the first time, the initial caries rates for the permanent teeth of the children aged six to eight years which were obtained, ten years earlier, in the control city of Oak Park.

The rates for the deciduous teeth, which were obtained at that time, still have not been published. This report provided the first opportunity to compare the initial caries rates of the younger children in the test city and its control (p. 153).

(16) The caries rates for the Evanston and Oak Park Public School white children compared favourably.

Comment. This statement is interesting-for the caries rates for children aged six to eight years in each of the three school groups have not been published (p.151). It will be recalled that the mean caries rates for the six, seven, and eight-year-old children in Evanston in 1946 were very much higher than the mean rates for children of those ages obtained during the initial examination in Oak Park. For the children aged six years the rate in Evanston was 46.85, but it was only 26.89 in Oak Park (Hill et al., 1958). Only 0.1 per cent of the Oak Park children were Negro (Hill et al., 1951), but exclusion of the data of Negro children (who have a relatively low caries rate, see 15) from the Evanston data would increase the rate of the remaining (white public and parochial school) children so that in the six-year-old children, it would be

higher than 46.85. Therefore the difference between this rate and the Oak Park rate of 26.89, for children of that age, would be increased.

Hill et al. did not say how many of the younger age group of children attended each type of school, but only twenty-two per cent of the twelve to fourteen-year-old children, shown in their 1957a report as examined in Evanston in 1946, attended parochial schools. Therefore, the proportion of children aged six, seven, and eight years who were attending parochial schools in Evanston in 1946, and their caries rate, must have been very high to permit Doctors Blayney and Hill to state that "The caries rates for the Evanston and Oak Park Public School white children compared favourably." Of course speculation is no substitute for data-and this still has not been published

(17) All of this clearly indicates how hidden variables may exist in areas which otherwise appear to be comparable, and how important it is to be certain that comparisons are made between like groups.

Comment. The latter phrase is a reiteration of remarks made in the 1957a report from this study, that it is necessary "to make comparisons of like groups." Why then, having realized this necessity, did Hill et al. ignore it in their 1958 report (p. 152)? In this report the data shown, for the year 1946, combined not only that of the white children attending both public and parochial schools, but the data of the Negro children as well. The resultant rate was then compared with that of children in Oak Park comprising, almost entirely, white children attending public schools. By ignoring the opinion they expressed in the previous year (1957a)-which they now reiterate-and comparing "unlike" groups of children, a more favourable degree of comparability was obtained between the initial caries rates of children in the test and the control cities.

(18) Dr Sutton expressed astonishment that in 1955 the six and seven-year-old Evanston children had a lower caries prevalence rate than the Aurora children of like ages. We, likewise, did not anticipate this. However, the same critical evaluation both clinical and roentgenological, was made of every case. This difference was due to something other than fluoride. Possibly the presence of the dental team in the school, year after year, has stimulated the classroom teachers and the school nurses to place more emphasis

on the teaching of oral health. Some unknown hidden variation not related to fluorides must account for the difference.

Comment. It is pleasing that Doctors Blayney and Hill should support the view expressed on page 187 (para. 4) that regular dental examinations may stimulate interest in the teeth and thus lead to improved oral health. In advancing the suggestion that "something other than fluoride" can affect the caries rates, they recognize the great importance which factors other than the fluoride concentration of the water supply may have on the caries rates. This extremely important matter was practically ignored by the authors of all these studies when preparing their reports.

(19) Dr Sutton was concerned that the control group was not examined annually. Neither we nor our advisers could see a reason to require an examination of the control group other than at the beginning and near the close of the study. This provides the baseline from which to measure the trend of the dental caries rate during the time interval (1947 1956). Should the rate in the last examination (1956) deviate materially from that of the initial baseline period (1947) that figure could be used as a correction factor in the Evanston findings. In fact, if we had not desired to measure the yearly decrement in the rate of dental caries under fluoridation and evaluate other factors, only two examinations in Evanston would have been necessary, the first in 1946 (before fluoridation), the second and final in 1961.

Comment. This statement makes two things clear. The first is that, at the commencement of the study, neither the workers nor their advisers could have considered the possibility, which they now acknowledge(18), that "the presence of the dental team in the school, year after year" might have had a stimulating effect "on the teaching of oral health." It is obvious that, if this effect is possible, not only the test town but also its control should have been examined "year after year". The other point which is indicated by this statement(19) of Doctors Blayney and Hill is that despite their remark in 1950, the importance of random variation was not and, seemingly still is not recognized.

(20) Much has been made of the variations reported in the number of children examined. The baseline examination of 4,375 Evanston children and of 2,493 Oak Park children are correct. However, the data from those children who had not used Lake Michigan water

all of their lives had to be excluded. It was also observed that some children below the age of 67 months and above the maximum of 174 months had been examined. Therefore these out of range children were not considered in the final determination of the caries rates. This explains the discrepancy between the Evanston 4,375 and 3,692 and the Oak Park 2,493 - 2,051 figures.

Comment. This explanation of the difference between these sample sizes in Evanston and Oak Park is welcome. It might have been deduced if the decision to exclude "the data from those children who had not used Lake Michigan water all of their lives" had been announced in one of the five reports giving caries rates, issued prior to 1955 (p. 163).

In the XIX Report (Hill et al., 1959), the sample sizes shown for the two age groups in Oak Park in 1947 (1,022 and 1,032) are almost the same as those shown (1,020 and 1,031) in statement "E" of Figure 5. Comparison with the statements for Evanston cannot be made for this (XIX) report considered only "public school white children".

(21) It should be noted that when dental caries experience rates were compared, the same number of examinations, that is 1,991 for the six to eight-year-old children and 1,701 for the 12 to 14-year-old children were used throughout the reports for the combined Evanston school groups (Public White Parochial and Public Negro).

Comment. It is surprising that the suggestion was made that this statement should be noted-for it is not correct. The number of twelve, thirteen and fourteen-year-old children examined in Evanston in 1946 was given in Tables III, V, VI, VII, VIII, IX and X of the XV Report (Hill et al., 1957a) as 418, 688 and 595, a total of 1,701. However, in Tables XI and XII of the same paper different sample sizes for these ages were shown: 414, 692 and 617, a total of 1,723. The same discrepancies were noted between different tables in the XI Report (Hill et al., 1955) Therefore the figure 1,701 was not "used throughout the reports for the combined Evanston school groups".

(22) Dr Sutton on p. 167 of his report (fig. 5, Statement C) calls attention to Evanston Dental Caries Study Report Number XVII. Here he points out that only 1,754 six to eight-year old children and 1,556 12 to 14-yearold children were listed. This particular report was primarily concerned with differences in sex and race, as they influenced caries, rather than the effect of fluorides. Therefore

a comparison was made of the dental caries experience rates of white girls to white boys; Negro girls to Negro boys; white girls to Negro girls; white boys to Negro boys; and white children as a group to Negro children as a group. The children were classified into male white, female white, male Negro and female Negro for comparison.

Comment. A curious feature of this XVII Report is that although care was taken in regard to the age, race, and sex of the subjects, no attempt was made to "limit the examinations to continuous resident children" (Hill et al., 1957b). Thus it is reasonable to assume that some children were examined who were not "continuous" residents. Therefore the comparisons mentioned by Doctors Blayney and Hill were made on mixed samples of children some of whom had not ingested fluoridated water, those examined in 1946, and others who had done so for varying periods of up to about eight years. This disregard of the possible effect of the ingestion of fluorides on the caries rates, of some of the children examined, is inexplicable.

(23) As Dr Sutton calls attention to the difference in the number of examinations made in this report when compared with other reports, we wish to point out, in explanation, that it was necessary to not only insure that children of correct age be included but also it was necessary that every examination be clearly classified according to race and sex. There were 236 six to eight-year-old children and 245 12 to 14-year old children excluded from this report because they did not fulfil the requirements for this comparison. These children were included in other reports as no distinction except age was made.

Comment. This explanation why the sample sizes from Evanston shown in the XVII Report (1,754 six to eight-year-old children and 1,556 twelve to fourteen-year-old children) do not agree with those shown in other reports at first appears to be a reasonable one. However, before it is accepted, consideration should be given to two observations. Firstly, if the figures depicted in statements "B" and "C" of Figure 5 which were originally given by Hill et al. and are now confirmed by Doctors Blayney and Hill (20, 22), are accepted as correct, the numbers of children excluded in the two age groups (1,991-1,754 and 1,701-1,556) were 237 and 145, not 236 and 245 as stated by Doctors Blayney and Hill. It is possible that these errors could have arisen in typing the manuscript, but this could not be the case in regard

to the second observation.

This second observation is as follows: In the XVII Report (Hill et al., 1957b) it was stated that "in this report no attempt has been made to limit the examinations to continuous resident children." Thus it is almost certain that data from both "continuous" and "non-continuous" resident children are included in the total of 3,310 subjects mentioned in that Report as examined in Evanston in 1946. Therefore, to determine the number of children who were excluded from the XVII Report, comparison must be made, not with the number of "continuous" residents of correct age that were examined in 1946 (3,692, see 20) and "were included in other reports", but with the total number of children ("continuous" and "non-continuous" residents and "out of range") that were examined in 1946, that is, 4,375.

If this is done, it can be seen that 1,065 of these children (4,375-3,310) were excluded from the XVII Report. This figure includes some "out of range" children, for it was stated that "some children below the age of 67 months and above the maximum of 174 months had been examined" (20) in the baseline examination of 4,375 Evanston children. Nevertheless, unless there were as many as 584 "out of range" children (1,065 = 584 + 481), the actual number of children excluded, because they were not of correct age or could not "be clearly classified according to race and sex", must have been larger than the figure of 481 given here (236 + 245) by Doctors Blayney and Hill.

(24) It is also pointed out that this report, Evanston No. XVII as noted above, was primarily concerned with comparison of the caries rates of the coloured and white children and not with the effect of fluoridation on dental caries rates. Therefore in this light, this report, No. XVII, should not have been listed under the general heading of fluoridation as Dr Sutton has it listed in his critique.

Comment. The XVII Report from Evanston was not listed as a fluoridation study; it appears in the list of references (as do other papers not specifically concerned with fluoridation) because it was mentioned in the text. It was consulted in an attempt to investigate the confusing matter of the differences in the sample sizes for 1946 and 1947 shown in the various reports.

(25) It is true that a discrepancy in figures published in our paper XVI, Table I and in paper XVIII, Table I are at variance This is due to the operator of the tabulating machine providing the wrong figures for the number of seven and eight year old children examined.

> This error was discovered after manuscript XVI was in press and therefore, the corrections could only be made manually in the reprints supplied to the readers who requested them.

Comment. If the errors contained in the XVI Report had been pointed out by providing an additional footnote to Table I in the XVIII Report (which was the next report in which this type of data was published) the reason for the difference between the two sets of figures would have been obvious. It should be noted that, although the source of the errors in the 1955 rates in Table 1, XVI Report was given, no mention has been made of the fact that, in the same table, there are errors in computing the rates for the six to eightyear-old age group in the years 1946 and 1948.Both of these errors were of long standing as they were shown, four years earlier, in the X Report (Hill et al., 1952). These errors were still contained in the XV Report (Hill et al., 1957a).

It can be seen that Doctors Blayney and Hill devoted a considerable part of their review to two matters. The first was the "comparability of the study and the control areas"—which was not questioned (see comment 13). The second was a lengthy description of the comparisons which they made between different groups of children in obtaining the data for the XVII Report. This information was given in almost the same words in that report, which, they stated (24), was not primarily concerned with the effect of fluoridation on dental caries rates.

However, they have not mentioned most of the matters which do directly concern fluoridation and caries prevalence and which were questioned. In fact their comments have touched on matters mentioned in only about a third of the sub-headings used in considering their study. Their meagre explanations have accounted for the presence of some of the errors in one table .... and have supplied a reason for the differences between the sample sizes for the year 1947 in Oak Park, and for the disparity between two of the three sample sizes for 1946 in Evanston (p 165) However, most of the matters mentioned in considering the Evanston study were ignored, even those illustrated by Figures 3 and 4.

It should be noted, therefore, that Doctors Blayney and Hill have not commented on the majority of the errors, omissions and mis-statements mentioned in considering the Evanston study, and almost all of them remain unexplained.

DR R. M. GRAINGER

The third review of this book in the Australian Dental Journal, by DR R. M. GRAINGER, Division of Dental Research, Faculty of Dentistry University of Toronto, was as follows:

Those whose work has been so unfairly criticized might well ask P. R. N. Sutton if he feels his own work is proof that the unimpeachable study can be done(26), or if he would welcome similar scrutiny of his publications.

While we do not claim to be able to answer every question to P R. N. Sutton's satisfaction (or even our own), in order to help set the record as straight as possible(27) the following are specific comments on points raised by P. R. N. Sutton in his discussion of the Brantford Study. No attempt is made to rationalize why specific workers directed or restricted their research efforts or discussion in any areas other than to comment that they no doubt accomplished as much as they could under the circumstances in which they had to work.

Item 1: Reference to Hutton et al. (1951). The numbers of children of the same age examined in the years 1944 and 1945 were very similar with the exception of the nine-year age group. From the unpublished data released at annual meetings in Brantford the number of children examined in 1944 was 239, and in 1945, 319; making a total of 558 (not 608). The data in Table I (Hutton et al.) were apparently combined by pooling the two years' results not by averaging the averages. However, the point is rather academic(28).

Item 2 : Reference to Ontario Health Department report. The date of water-fluoridation in Tables I and 11 was given as 1946 through a typographical error but was twice correctly stated to be June, 1945, in the text referring to the Table. The small error in percentage reduction for seven-year-olds was also conceded. These points do not seriously underline the usefulness of the work(29).

Item 3: Re late commencement of National Health and Welfare study and detection of caries protection for young individuals born prior to commencement of fluoridation. Despite the fact that the Department of National Health and Welfare began its control study nearly three years after fluoridation began, much worthwhile information was obtained and the effect of late commencement, if any, was to result in underestimation of the fluoride protection(30).

Item 4: Reason for selection of control cities. It seems clear that Brown (1951) gave adequate reasons for selecting Sarnia and Brantford(31).

Item 5: Re superior dental care in Brantford. The difference in level of dental care between the cities is factual as recorded by Brown (1952). This variation of numbers of teeth classified as F. rather than D. or M. does not fundamentally influence the DMF rate(**32**).

Item 6: Comparability of rates. As stated under item 5, the dental condition of the children in Sarnia and Brantford differed in 1948 because a lower level of dental treatment in Sarnia resulted in higher tooth mortality. The tooth mortality rates thus differed but it does not follow that the DMF rates differed(**33**). Brown's statement (1951) "by 1948 the Brantford data were not greatly different from those in Sarnia" is obviously referring to DMF rates and hence quite valid(**34**). The differences in oral hygiene are also only remotely related to the DMF rates under discussion(**35**).

Item 7: Concentration of fluorides. The fluoride content of the Brantford water supply was raised to approximately 1 ppm in June, 1945, and raised to 1.2 in February, 1949(**36**) The Stratford water fluoride content is believed to have been in the order of 1.3 to 1.6 ppm since 1917 when the wells were drilled. Naturally no analysis for fluoride was available prior to the beginning of the interest in fluoridation and early techniques for analysis were not as reliable as present methods(37). These facts have been recorded in the writings of the primary workers (Hutton et al., 1951; and Brown et al., 1951, 1952, 1953, 1954, 1956) and the differences in amounts from other writers night seem less "strange" if they were merely acknowledged to be minor misquotations(**38**).

Item 8: Re statement by Brown et al. (1956). The statement is substantially correct with the exception that Brown's observational period did not begin until 1948 hence is less than 10 years(**39**). The decrease in mean df rates for the 9-11 years group in Sarnia between years 1948 and 1954 (Brown, 1956), did not continue into 1955(40). There was a highly significant decrease over the period 1948 to 1955 (2.37 to 1.93) in Brantford and no significant decrease in Sarnia (2.50 to 2.31)(41). In the same periods the mean df rates for this age [in] Stratford remained nearly equal (1.66 and 1.65) and increased for other ages (**42**).

Item 9: Re Table II: Ontario Department of Health Report. The printing of dashes rather than percentages for the control cities was to avoid confusing the table With "negative reductions" and in the case of the 9 to 11 df figure

to avoid emphasising what was considered to be a spurious decrease(**43**). This judgment was borne out by the 1955 figures(**44**).

Item 10: Differences in reported rates between examiners. Different examiners give characteristically higher or lower rates upon examining the same individuals due to differences in skill, training the physical condition. Thus the differences quoted are no reflection on the design of the experiment or the care taken in the work. The strength of the double examinations comes through corroboration of caries trends in Brantford over the years and not through interchangeability of data(**45**).

Item 11: Significant fluctuations in controls. The important point is that for the controls the inter-year changes were upward trends or mere fluctuations (even though in some cases calculated to be beyond change), whereas in Brantford the change took the form of a highly significant continual downward trend(**46**).

Item 12: Larger percentage changes in control. There is no definite explanation as to why rates increased in Stratford and also in Sarnia over the ten years, but this may be a reflection of a general post-war increase in dental caries which has been seen in other areas. However, it is significant that in the various fluoridation experiments, e.g. in Brantford, Newburgh, Grand Rapids, etc., the shift has always been significantly downward in the fluoridated cities whereas the control city rates have remained about the same or in the case of Stratford, increased(**47**).

Item 13: Smaller percentage decrease after longer fluoridation. As pointed out by Sutton himself on page 168 (middle paragraph) the fluoride protection for permanent teeth of the children aged six to seven seemed to occur within two or three years after fluoridation began. Thereafter the yearly DMF rates were subject to random fluctuation and the differences in percentage decrease of 69 per cent and 51 per cent are most likely a reflection of this inter-year variation(**48**).

Item 14: The quotation from the Ontario Government Report is taken out of context from a series of summary statements. The previous statement was to the effect that in Brantford there had been a significant decrease of about 60 per cent in DMF rates. In the statement following, as picked out by Sutton, it was stated that “no change” occurred in Stratford and

Sarnia(**49**). It should be clear enough from the context that the words "no similar downward change" were inferred(**50**).

Item 15: Possible weighting effect. The critic is referring to a possible shift in age distribution within the group, e.g. a possible sampling shift within the six to eight-year age group so that certain years had disproportionately higher or lower numbers of eight-year-olds and hence higher or lower average caries scores. This is rather remote in that selection methods used by Dr Brown were the same each year, moreover very large shifts in age distribution would be needed to produce the significant differences to which P N. R. Sutton refers(**51**).

Commentary on the Review by Dr R. M. Grainger

(**26**) Dr R. M. Grainger raises the question as to whether "the unimpeachable study can be done". This is, of course, unlikely. It is precisely for this reason that all papers (and these include my own) which set out to present new knowledge should be examined, in order to reduce the chance that findings which are not soundly based will be accepted at their face value. This is particularly necessary in those studies which may involve the health of the public.

(**27**) The result of Dr Grainger's attempt "to help set the record as straight as possible" will be judged after considering his other remarks.

(**28**) Item 1, Reference to Hutton et al. (1951); The numbers of children of the same age examined in the years 1944 and 1945 were very similar with the exception of the nine-year age group. From the unpublished data released at annual meetings in Brantford the number of children examined in 1944 was 239, and in 1945, 319; making a total of 558 (not 608). The data in Table I (Hutton et al.) were apparently combined by pooling the two years' results not by averaging the averages. However, the point is rather academic.

Comment. The phrase "making total of 558 (not 608)" suggests that the figure 608 was an error in this monograph. This is not the case, in fact this figure was not mentioned. It was published by the authors of this study, Hutton et al., in 1951 (Table 1, column 2). Dr Grainger, therefore, is suggesting that

the total 558 children (derived from the unpublished figures of 239 and 319) is correct, and that the figure of 608 children examined, published by the authors of the study, is incorrect. It should be noted that, five years after this figure of 608 was first published, in Table II, column 2, of their final report Hutton et al. (1956) again published their figure of 608. In both the tables in which it appears it has been used in computing the def and the DMF rates. Also, if one accepted Dr Grainger's figure of 558 as the correct number of nine-year-old children examined in these two years, the impossible situation would also have to be accepted in which the number of these children with decayed, missing or filled teeth, which Hutton et al. (1951) gave as 595, would exceed the number of children examined.

(**29**) Item 2: Reference to Ontario Health Department report. The date of water-fluoridation in Tables I and II was given as 1946 through a typographical error but was twice correctly stated to be June, 1945, in the text referring to the Table. The small error in percentage reduction for seven-year-olds was also conceded. These points do not seriously undermine the usefulness of the work.

Comment. The "small" error in percentage reduction, which, Dr Grainger said "was also conceded", was the showing of 51 per cent instead of 66 per cent (p. 167). Dr Grainger does not mention here the substitution of dashes for figures in the two cases of reduction in the caries rate in the control cities (pp. 4, 37, 44). Several types of errors are present in Tables I and 11: (a) two omissions, which Dr Grainger implied-Item 9 of this review(43)-were made deliberately; (b) two typographical errors; (c) two arithmetical errors (Table I, age 7, "% Reduction Since 1944-45" in the caries attack rates should be 66, not 51, and in Table II, age 10, the "% Reduction Since 1944" in the caries attack rates should be 18, not 61); and if, as appears likely, the figures given by Dr Grainger in Item 1, of this review(28), are incorrect and were used, (d) four incorrect mean figures.

Dr Grainger contends that the points which he mentioned "do not seriously undermine the usefulness of the work"; but the occurrence, on one page alone, of all the errors and omissions which have just been mentioned certainly undermines confidence in the care taken in the preparation of this official report by the anonymous "statisticians" of the Division of Medical Statistics, Ontario Department of Health.

(**30**) Item 3: Re late commencement of National Health and Welfare Study and detection of caries protection for young individuals born prior to commencement of fluoridation. Despite the fact that the Department of National Health and Welfare began its control study nearly three years after fluoridation began, much worthwhile information was obtained and the effect of late commencement, if any, was to result in underestimation of the fluoride protection.

Comment. Dr Grainger does not state the nature of this "worthwhile information" but, whatever it was, it could not compensate for the lack of a pre-fluoridation caries assessment in this study. Its late commencement could be justified only if it was known that the caries rates in Brantford had not been affected by the ingestion of fluorides prior to the baseline examination (p. 168). However, the results from the City Health Department study, if taken at their face value, indicated that there had been marked and erratic changes: at first a considerable rise in the DMF rates after about one year of fluoridation, followed by a marked fall during the second year. It is surprising, therefore, that, out of all the cities in Canada, Brantford was chosen as the location of two long-term studies, for it should have been obvious that the value of the second study would be severely limited by the fact that the very important data showing the pre-fluoridation caries rates could never be obtained.

(31) Item 4: Reason for selection of control cities. It seems clear that Brown (1951) gave adequate reasons for selecting Sarnia and Brantford.

Comment. As Dr Grainger notes, this paragraph refers to the selection of the control cities, which were Sarnia and Stratford-not "Sarnia and Brantford".

The sole reference to the selection of control cities which Brown (1951) gave is as follows: "The Ontario Dental Division, under Dr Frank Kohli, volunteered assistance, as did Dr G. L. Anderson, Medical Officer of Health for Sarnia, and Dr H. B. Kenner, Medical Officer of Health for Stratford, and both these cities entered the study as controls. (The water of Sarnia is fluorine-free, and that of Stratford contains 1.3 ppm. of fluorine from a natural source.)" Dr Grainger considers that "Brown (1951) gave adequate reasons" for the selection of the control cities-but few would agree with him.

(32) Item 5: Re superior dental care in Brantford. The difference in level of dental care between the cities is factual as recorded by Brown (1952). This variation of numbers of teeth classified as F. rather than D. or M. does not fundamentally influence the DMF rate.

Comment. Increased dental care usually includes some prophylactic treatments and, as noted by Doctors Blayney and Hill (18). even regular examinations may be accompanied by "more emphasis on the teaching of oral health." This statement by Dr Grainger implies that he considers that such increased dental care has no influence on the total DMF rate.

(33) Item 6: Comparability of rates. As stated under Item 5, the dental condition of the children in Sarnia and Brantford differed in 1948 because a lower level of dental treatment in Sarnia resulted in higher tooth mortality. The tooth mortality rates thus differed but it does not follow that the DMF rates differed.

Comment. It does not state "that the DMF rates differed; it points out, as its title states, the "Doubtful comparability of rates" owing to the delay in setting up this study. Dr Grainger's comments suggest either that he has not understood the meaning of the first sentence of the paragraph, or that he is seeking to distract attention from the presence of this important deficiency in the study-its late commencement.

(34) Brown's statement (1951) "by 1948 the Brantford data were not greatly different from those in Sarnia" is obviously referring to DMF rates and hence quite valid.

Comment. This quotation does not appear in Brown (1951) but a similar statement was made by Brown et al. in 1953 and 1954 (b) and is given on page 169. The fact that it was "obviously referring to DMF rates" was not questioned. The implications of this remark were discussed.

(35) The differences in oral hygiene are only remotely related to the DMF rates under discussion.

Comment. Brown et al. (1954b) said that "marked differences in oral hygiene as between the test and control groups might conceivably affect the findings". Such "marked differences" were reported-but were disregarded (p 41).

(36) Item 7: Concentration of fluorides. The fluoride content of the Brantford water supply was raised to approximately 1 ppm in June, 1945, and raised to 1.2 in February, 1949

Comment. This statement of Dr Grainger is welcome because it provides the answer to the question: Which of the statements regarding the concentrations of fluorides in the Brantford water, which were reported on page forty-two, are accurate and which ones are not?

(37) The Stratford water fluoride content is believed to have been in the order of 1.3 to 1.6 ppm since 1917 when the wells were drilled. Naturally no analysis for fluoride was available prior to the beginning of the interest in fluoridation and early techniques for analysis were not as reliable as present methods.

Comment. This statement is most revealing for it indicates that the wells at Stratford have been analyzed to determine their fluoride content only since "the beginning of the interest in fluoridation". If this is the case, the statements of Brown et al, (1953, 1956), concerning the "continuous" use of water containing fluorides in concentrations of 1.3 ppm or 1.6 ppm since 1917 are not founded on data and are, therefore, merely different guesses.

(38) These facts have been recorded in the writings of the primary workers (Hutton et al., 1951; and Brown et al., 1951, 1952, 1953, 1954, 1956) and the differences in amounts from other writers might seem less "strange" if they were merely acknowledged to be minor misquotations.

Comment. It was pointed out that the "facts" regarding fluoride concentrations were stated differently in these papers. In regard to the concentration in the Stratford supply, a comparison of the statements made by Brown et al., in 1953 and 1956 suggests that the concentration of fluorides in this supply may have increased from 1.3 to 1.6 in this three year period. The important admission that the fluoride concentration in Stratford was obtained only relatively recently, is not contained in any of the six "writings of the primary workers" mentioned by Dr Grainger. Therefore his statement is not correct.

As Dr Grainger suggests, it is not unlikely that the statements regarding fluoride concentration of the "other writers", the New Zealand Commission of Inquiry (1957) and the Ontario Department of Health (1956), were "minor misquotations".

(39) Item 8 Re statement by Brown et al (1956). The statement is substantially correct with the exception that Brown's observational period did not begin until 1948, hence is less than 10 years.

Comment. Dr Grainger suggests that the phrase "more than ten years" is incorrect. It was inserted into the quotation of a statement by Brown et al. (1956), but enclosed in square brackets to indicate that it was not a part of the quotation. However, in the sentence which immediately precedes that quotation Brown et al. (1956) said: "Brantford has had more than 10 years of experience with 1 part per million of fluoride in its water supply. During that time... "It is clear that they were not referring to "Brown's observational period" of about seven years, but to the period of fluoridation in Brantford which commenced in June 1945 (Hutton et al., 1951; p. 173) and was, therefore, "more than 10 years".

(40) The decrease in mean df rates for the 9-11 years group in Sarnia between the years 1948 and 1954 (Brown, 1954), did not continue into 1955.

Comment. The 1955 rate of 2.31 df was still below the 1948 and the 1951 figures of 2.50 and 2.41 respectively.

(41) There was a highly significant decrease over the period 1948 to 1955 (2.37 to 1.93) in Brantford and no significant decrease in Sarnia (2.50 to 2.31).

Comment. The decrease mentioned by Dr Grainger (2.37 to 1.93) was reported in Brantford between 1948 and 1954 (Brown et al., 1954b) not "over the period 1948 to 1955". In 1955 this rate rose to 1.99 (Brown et al., 1956), and the difference between 1948 and 1955 was no longer said to be "highly significant" (Brown, 1955)

The rates quoted by Dr Grainger for Brantford are for the years 1948 and 1954 (see 63). It should be noted that it was between these two years that the maximum "decrease" was reported in the rates in that test city (2.37 to 1.93). Furthermore, in mentioning Sarnia, instead of giving the figures for the same period (1948-54), 2.50 to 2.11, he cited the figures 2.50 to 2.31, which cover a different period (1948-55) and do not reveal (Brown, 1955) the significant "decrease", in the rate in this control city, which was shown in the previous report (Brown et al., 1954b). By the use of these figures,

the reviewer exaggerates the contrast between the test city and this control. Thus, this statement by Dr Grainger is both inaccurate and misleading.

(42) In the same periods the mean df rates for this age [in] Stratford remained nearly equal (1.66 and 1.65) and increased for other ages.

Comment. The rates for the four examinations were: 1.66, 1.76, 1.58, 1.65 (Brown, 1955). (Throughout this monograph caries rates have been given in the form in which they appear in the original papers although it is recognized that, in cases such as these, the practice of showing caries rates with two places of decimals is, probably, not warranted.) Dr Grainger mentions the least variable of the ten caries rates in the control cities—that for the deciduous teeth of children aged nine to eleven years in Stratford. He omits to mention the DMF rates which show the remarkable situation, in this control city, in which each of the inter-year changes occurring in this age group, and in five out of the six inter-year changes in the rates of the "other ages", were said by Brown (1955) to be statistically significant.

(43) Item 9: Re Table 11, Ontario Department of Health Report. The printing of dashes rather than percentages for the control cities was to avoid confusing the table with "negative reductions" and in the case of the 9 to 11 df figure to avoid emphasizing what was considered to be a spurious decrease.

Comment. This astonishing explanation, for the printing of dashes in this table, implies that these omissions were made deliberately because the results did not conform to those expected. Why should a decrease of 0.44 df (18 per cent) in the test city be accepted and published, but a very similar one of 0.39 df (16 per cent) in a caries rate in the control city of Sarnia be considered "spurious" and not published-a dash being shown in the appropriate position in the table? By printing these dashes, the "statisticians" of the Ontario Department of Health could have misled their Minister into thinking that there were no changes in these caries rates in Sarnia and Stratford (particularly as the Summary of the report said so) but that there had been a decrease of eighteen per cent in the corresponding rate in Brantford due to fluoridation.

Talk of "negative reductions" cannot disguise the fact that nothing is more

calculated to confuse a table than (as Dr Grainger implies) the deliberate omission by "statisticians" of figures giving the percentage changes in rates (one of which was said to be significant).

(44) This judgement was borne out by the 1955 figures.

Comment. Dr Grainger tries to justify this "judgment" by implying that these so-called "spurious" decreases were not seen in the 1955 figures. However, small "decreases" were still shown in that year, the "reduction" in Sarnia being 7.6 per cent.

In any case, this so-called "judgment", regarding the omission of data, has no place in the preparation of an unbiased report.

(45) Item 10: Differences in reported rates between examiners. Different examiners give characteristically higher or lower rates upon examining the same individuals due to differences in skill, training the physical condition [sic]. Thus the differences quoted are no reflection on the design of the experiment or the care taken in the work. The strength of the double examinations comes through corroboration of caries trends in Brantford over the years and not through interchangeability of data.

Comment. Dr Grainger refers to the differences between examiners in the assessment of caries rates. This important matter has already been considered. The aim of the paragraph mentioned was to show that, as the rates obtained by the examiners in the two Brantford studies were different, data from the City Health Department study could not be used to decrease "the deficiency in the data of the National Health and Welfare study, owing to its late commencement". The admission, which is implicit in Dr Grainger's remark, that "interchangeability of data" was not permissible between the two studies in Brantford confirms the point made. The degree of reliance which can be placed on the "corroboration of caries trends in Brantford over the years" must be considered in the light of the widely divergent results obtained in these studies, which were discussed in the second paragraph of page three.

(46) Item 11: Significant fluctuations in controls. The important point is that for the controls the inter-year changes were upward trends or mere fluctuations (even though in some cases calculated to be beyond change) [sic], whereas in Brantford the change took the form of a highly significant continual downward trend.

Comment. It was pointed out that in the control city of Stratford five out of the six comparisons made between the permanent teeth rates of successive years were said by Brown et al. (1954b) to be significant changes (four of them being at the three standard error level). In the permanent teeth rates in the other control city, Sarnia, there were four highly significant and one significant change in the nine comparisons made. Brown et al. (1953, 1954b) and Brown (1955) said that the odds relating to the occurrence by chance or sampling variation of a difference of the magnitude of three standard errors (such as were reported in eight of these changes) "are 369 to I against". Therefore, when Dr Grainger terms these unexplained changes "mere fluctuations" he is rejecting that remark of Brown et al. and denying the meaning of statistical significance.

Dr Grainger neglected to mention that the "highly significant continual downward trend" in the caries rates in Brantford occurred only in children who were aged twelve to fourteen years. In the two other age groups, in both the deciduous and the permanent dentitions, there was an upward trend in the caries rates in the fluoridated city during the last year of the study, the rise from 0.44 DMF to 0.69 DMF, in the youngest age group, being said to be a highly significant rise (Brown, 1955). Therefore this statement by Dr Grainger, that there was a "continual downward trend" in Brantford, is incorrect and is misleading.

(47) Item 12. Larger percentage changes in control. There is no definite explanation as to why rates increased in Stratford and also in Sarnia over the ten years but this may be a reflection of a general post-war increase in dental caries which has been seen in other areas. However, it is significant that in the various fluoridation experiments e.g. in Brantford, Newburgh, Grand Rapids, etc., the shift has always been significantly downward in the fluoridated cities whereas the control city rates have remained about the same or in the case of Stratford, increased.

Comment. Dr Grainger's statement, that the "rates increased in Stratford and also in Sarnia over the ten years", is inaccurate for, as he pointed out in his Item eight (39), "Brown's observational period did not begin until 1948, hence is less than 10 years." Sarnia was first examined in March 1948 and Stratford in October of that year (Brown, 1952). Therefore the caries rates of the children in both those towns were known for a period of about seven

years, not one of ten years. Furthermore, in the deciduous teeth in Sarnia, the younger age group showed a higher rate in 1955 than in 1948, but in the older children the final rate was lower than the initial one. In this city the DMF rate rose between 1948 and 1953 but between that year and 1955 there was a decrease in this rate in each of the three age groups.

The suggestion that there has been "a general post-war increase in dental caries" is not supported by these studies, for such a rise it was not seen in any of the unfluoridated control cities considered. In Muskegon and Oak Park there was no definite trend. At the time when (as a result of their being fluoridated) these cities ceased to serve as controls, the rates for the children of some ages were higher, and for other ages they were lower, than during the initial examination. The trend in Kingston cannot be investigated owing to the method of presenting the data in the Newburgh study. The contention that "the shift has always been significantly downward in the fluoridated cities" can be accepted only if the many deficiencies pointed out in this monograph are ignored and the figures from these trials accepted at their face value.

(48) Item 13: Smaller percentage decrease after longer fluoridation. As pointed out by Sutton himself on page 168 (middle paragraph) the fluoride protection for permanent teeth of the children aged six to seven seemed to occur within two or three years after fluoridation began. Thereafter the yearly DMF rates were subject to random fluctuation and the differences in percentage decrease of 69 per cent and 51 per cent are most likely a reflection of this inter-year variation.

Comment. No specific mention was made of "the children aged six to seven" when pointing out the reductions in the DMF rates which were reported to have occurred in the early years of the City Health Department study (Hutton et al., 1951). Some implications of this reported early decrease in caries rates were discussed on pages two and thirty-eight.

When he makes the remark that "the differences in percentage decrease of 69 per cent and 51 per cent are most likely a reflection of this inter-year variation", Dr Grainger shows that he could not have noted that the increase in the DMF rate in these children, in the fluoridated city, from 0.44 in 1954 to 0.69 in 1955 (so that the "percentage decrease" dropped from 69 per cent

to 51 per cent), was shown by Brown (1955) to be, statistically speaking, a highly significant (three standard error level) rise in the rate in the test city during the final year of the study. Therefore, when he makes this suggestion, he is expressing an opinion which contradicts the notation given by Brown (1955), in his Table IV, which indicates that the rise in rates which produced this percentage "decrease" is statistically significant at the three standard error level.

Dr Grainger may be right-but if he is, Brown's (1955) indication of statistical significance in this case is incorrect, and the methods used in the National Health and Welfare study for calculating statistical significance must be questioned. In consequence, all statements made in the study regarding significant changes in the caries rates, both in the test city and its controls, become doubtful.

It is of interest to note that the "1955 Report" from this study was released in two different publications. The first, a booklet, was dated November 1955, and was "prepared by H. K. Brown . . . with the assistance of H. R. McLaren... G. H. Josie... and Barbara J. Stewart". The second publication is a paper by Brown, McLaren, Josie and Stewart published in 1956 in the Canadian Journal of Public Health, no reference being made to the previous publication. The ten tables and the two figures in the body of these reports are the same and the text of both is practically identical. However, there is one important difference: that part of the discussion dealing with the unexplained rise (shown as significant) in the DMF rate of children aged six to eight years in Brantford (and also in the control city with the "optimum" concentration of fluorides in its water), was omitted from the later report (Brown et al., 1956).

The questions should be asked: Why was this very important small section of the original report omitted when it was published in the Journal? Why, in both these 1955 reports, was the smaller percentage "decrease" between the initial and the final caries rates of the youngest age group in Brantford not published?

(**49-50**) Item 14 The quotation from the Ontario Government Report is taken out of context from a series of summary statements. The previous statement was to the effect that in Brantford there had been a significant decrease of about 60 per cent in DMF rates. In the statement following, as picked out by Sutton, it was stated that "no change" occurred in Stratford and Sarnia(49). It should be

clear enough from the context at the words "no similar downward change" were inferred(50)

Comment. The charge that the quotation mentioned was "taken out of context" is meaningless unless it implies that the sense of the original statement has been altered. So that the reader can judge this matter, the whole of paragraph three (the "previous statement" referred to by Dr Grainger) and paragraph four are reproduced. The quotation given on page 176, which was the one criticized, is shown here in italic type to distinguish it from its context.

The evidence produced by the investigators of the Brantford City Health Department and of the Department of National Health and Welfare, independently show that since the introduction of the fluorine in the water there has been a significant decrease, amounting to approximately 60 per cent in the number of decayed, missing and filled teeth suffered by Brantford school children.

At the same time, it has been established that there has been no change in the already low dental caries attack rates in Stratford which has 1.2 ppm of natural fluoride in its domestic water, or in the relatively high rates for Sarnia which has had virtually no fluoride in its water."

Dr Grainger suggests that the writers of this report, when they used the expression "no change", really meant "no similar downward change". However, as they were members of the Division of Medical Statistics and, presumably, were trained in the very precise science, of statistics, it is unlikely that they would use such an inexact expression. Also, the term "downward change" is a rather clumsy substitute for the word "decrease" which was used in the previous paragraph (para. 3 above). Both these points suggest that Dr Grainger's interpretation is incorrect.

(51) Item 15 Possible weighting effect. The critic is referring to a possible shift in age distribution within the group, e.g. a possible sampling shift within the six to eight-year age group so that certain years had disproportionately higher or lower numbers of eight-year-olds and hence higher or lower average caries scores. This is rather remote in that selection methods used by Dr Brown were the same each year; moreover very large shifts in age distribution would be needed to produce the significant differences to which P N. R. Sutton refers.

Comment. After reading Dr Grainger's remarks it may be supposed that it

was said that the inter-year significant changes in caries rates, reported from the control cities, were due to a "weighting" effect. However, if the original paragraph is consulted, it will be found that it is headed "Unexplained Significant changes in controls." A "weighting" effect was mentioned as a possible explanation for these unexplained changes. This suggestion was made following the failure of the authors (Brown, 1951, 1952; Brown et al., 1953, 1954b, 1956) to advance even a suggestion why these changes occurred. Dr Grainger's comment leaves these significant changes in the caries rates of the control cities as the authors of this study left them - unexplained.

This reviewer has made it clear that the statements regarding the "continuous" use of water containing fluorides in concentrations of 1.3 or 1.6 ppm since 1917 in Stratford are not based on data (comment 37); and that the misleading omission of figures from the Ontario Department of Health Report (1956) was made deliberately (comment 43). However it has been seen that, although Dr Grainger said (**27**) that his aim was "to help set the record as straight as possible", most of his comments, if they had been accepted at their face value, would have had the reverse effect.

MR J. FERRIS FULLER

Apart from the reviews already quoted above, the only published criticism known to the author is that contained in the Book Reviews section of the January 1960 issue of the *New Zealand Dental Journal.* This was contributed by MR J. FERRIS FULLER, a member of the Dental Research Committee of the New Zealand Medical Research Council and a member of the Fluoridation Committee of the Department of Health, whose submissions to the New Zealand Commission of Inquiry (1957) are mentioned in over twenty paragraphs of its report.

Mr Fuller's review stated:

> "Everyone is out of step except our Albert," or so the author would have us conclude. Altogether an extraordinary book; clever but unfortunate; skilfully contrived and yet-stripped of its finery-rather slender. It could be ignored if the matter rested within the Sciences; but since by the very nature of the subject it takes us into the public forum, some of the errors must be stated..

Part I of this book (Fluoridation: Errors and Omissions in Experimental Trials) is a reprint of a paper by Sutton and Amies(*) that appeared recently in the Medical Journal of Australia criticising the Brantford-Sarnia-Stratford study in Canada(**52**). But the authors have omitted to read the literature(**53**), and their criticisms therefore are not based on the known facts. This is a serious matter especially when the comments come from two critics who exalt themselves above fellow scientists of at least equivalent status in other parts of the world. They accuse the Canadian workers of failing to devise a randomisation procedure that would eliminate bias(**54**), of deliberately omitting vital information in some of the tables(**55**), and finally of displaying bias in the presentation of results(**56**). Their comments are based on a report of the Ontario Department of Health (1956) to the Ontario Minister of Health, a report obviously written in simple abbreviated terms for public consumption(**57**). Sutton and Amies failed to read two official publications readily available(**58**), namely, a 51-page booklet "A suggested methodology for fluoridation surveys in Canada" and the 35-page detailed report of the Department of Health and Welfare, of November, 1955 These two booklets together show that great care was taken to introduce a well-designed randomisation procedure(**59**), that examiner variability was eliminated as far as humanly possible by the employment of one examiner only throughout the whole period of the study(60), and that the information

* See footnote, p. 1

alleged to have been omitted is in fact shown in detail in the tables in the 1955 report(**61**), together with the standard error for each of the indices used. In short, the more important criticisms that appear so damaging are in fact without foundation. Thus, when the authors say that "what must be eventually a statistical study does not appear to have been designed as such" and "no attempt at statistical evaluation has been considered" their comments are absurd and, indeed, irresponsible(**62**). The full official report on the Brantford study was available in New Zealand, incidentally, when the Commission of Inquiry held its hearings(**63**), and three of its tables are included in the published report of the Commission.

In Part 2 of the book Sutton continues in the same vein. He complains that misleading comments are made in some reports, yet his own book contains many misleading statements. For example, he claims that a proper evaluation of examination errors at Grand Rapids has not been carried out(**64**), and he doubts the accuracy of caries attack rates in test and control areas because X-ray examinations were incomplete or absent(**65**). It is significant that he omits to refer to a report by Hayes, McAuley, and Arnold published in the U.S. Public Health Report in December, 1956, which is a key reference in this subject(**66**). This report met the specific point that "some observers have suggested that X-rays are essential to determine the efficacy of caries control measures" and an investigation was undertaken "to determine whether or not supplementing direct observation with X-ray examinations would affect the conclusions based on direct observation alone." The conclusion was that supplementary X-ray examinations supported the clinical findings and did not change the basic observation that substantial decreases in dental caries occurred during the test period. The very standard errors that Sutton demands for a proper statistical evaluation were available in this report(**67**). He quotes a subsequent (1957) paper by McAuley that suits his book and, in the light of his criticisms and allegations, this makes the omission of any reference to the 1956 report more damaging(**68**). To borrow his own phrase, omissions of this nature render his work "open to doubt." Sutton criticises his overseas colleagues for their inability to examine children in control towns prior to fluoridation(**69**). With personal experience of a study of this nature he would appreciate that where on the one hand the interests of a large number of people and their local bodies and institutions are concerned as compared with only one or two examining personnel on the other, it is almost impossible to operate a plan to the exactitude dreamed of at the statistician's desk. In any event, the criticism is rather meaningless as far as the Grand Rapids study(**70**) is concerned when we realise that the baseline

examination in the control city of Muskegon showed that caries prevalence in that city is of the same order as in Grand Rapids.

In attacking the Evanston-Oak Park study, Sutton bemoans the lack of information about the design of the study and phrases such as "It is not clear...", "It is not understood...", (It) was not stated..." give the lead to questions and speculations that follow. But why not adopt the simple expedient of writing to the workers concerned and so finding out instead of speculating? This attitude is typical of the book(**71**). And typical also is the quibbling over details that do not detract one iota from the part that fluoridation has played in these areas in reducing dental decay(**72**). "The total tooth surfaces considered... should be 58,325, not 58,352" says the author, and also... the mean of these values for 1946... is 150.09, not 149.76"(**73**). Dear me, Dr Sutton, how dreadful.

And then we come to the Newburgh-Kingston study. Prominence is given to the different composition of the waters at Newburgh as compared with the control city of Kingston(**74**), and this is cited as the reason why the latter is unacceptable as a control. But once again Sutton omits any reference to a key report, that by Dean, Arnold, and Elvove of August, 1942, listing caries prevalence rates in communities where the variables in the domestic water mentioned by Sutton varied to a greater degree than between Newburgh and Kingston without caries prevalence being markedly affected(**75**).

The author complains of bias in the manner in which some results are presented but, as can be seen, he displays bias himself in the choice of articles he quotes(**76**) and in his omission to read others. It is not surprising, therefore, to see him fall into the familiar pattern of the anti-fluoridationist. Those who question fluoridation are given the familiar title of "eminent authorities," a distinction not afforded anyone else(**77**). It is surprising, however, to see him serve his ends by quoting Feltman's study on the use of fluoride tablets. This study lacks the very control that one would expect Sutton to consider essential(**78**).

As one would expect, there are no bouquets for the New Zealand Commission of Inquiry, one complaint being that "no mention was made of the employment of a statistician to assist its members in evaluating numerical data." Had the author inquired, he would have been told that the Professor of Biochemistry on the Commission was well versed in biometrics, and that scientific witnesses quickly discovered that tables were unacceptable unless they contained complete details including standard errors, so that he could evaluate data statistically for himself and the Commission(**79**).

Finally, a warning to those reading this book, lest they be misled by the polemics and the array of figures. Please note that Sutton's conclusions in part 2 (which forms the greater part of the book) are confined to variations in the prevalence of dental decay in control cities and not to the cities where fluoride has been added(80). What of the places where fluoridation has been adopted? Sutton does not dispute the fact that the prevalence of dental decay has been substantially reduced in the fluoridation cities of Grand Rapids, Newburgh, Brantford, and Evanston(81), nor does he mention that these good results have been confirmed by several independent studies in the U.S.A., and also in Tasmania, Brazil, Japan, Germany, Sweden, and at Hastings in New Zealand(82). The validity of the results from Hastings, incidentally, has been checked by the Applied Mathematics Laboratory of the New Zealand Department of Scientific and Industrial Research(83).

The anti-fluoridationists will rejoice with fresh ammunition to replenish their stocks; but it is unlikely that this work will serve any useful purpose in scientific circles despite the author's rather pretentious hopes. The performance is almost as old as Time: "The mountains are in labour, there will be born a ridiculous mouse," said the ancient poet.

Commentary on the Review by Mr J. Ferris Fuller

(**62**) The charge made by Mr Fuller that 'their comments are absurd and, indeed, irresponsible' will be considered first, partly because of its serious nature and partly because it sets the standard for his criticisms.

This charge is made by misquoting parts of two sentences (para. a, p. 4). In the second misquotation the word 'comprehensive' was omitted by Mr Fuller, thus completely distorting the meaning of the original sentence.

Fortunately, the fact that Mr Fuller gives several other 'quotations' from the first edition which are not completely accurate permits the interpretation that the omission of the word 'comprehensive' is due to Mr Fuller having read the monograph only superficially prior to publishing his review. If this is not the case, the more unfortunate conclusion must be fared: that he deliberately made this omission in an attempt, by the use of misquotation, to discredit the statements of those whose findings contradict his own beliefs.

Despite the fact that a study of Parts One and Two of this monograph will show the true nature of most of the remaining points raised by Mr Fuller, in order to avoid the possible suggestion that the objections which he raised have not been refuted, some comments will be made on them.

(**52**) Part One mentions the experimental trials which have been conducted in Brantford, Canada, and in Grand Rapids, Newburgh and Evanston, U.S.A. (p. i). The comments made in it were not confined, as this reviewer infers by his comments and by here ignoring the other studies, to 'the Brantford. Sarnia-Stratford study in Canada'.

(**53**) In regard to the remark of Mr Fuller that 'the authors have omitted to read the literature' it may be noted that the brief paper (Part One), which he is criticizing in this paragraph of his review, contains references to seven of the original papers which deal with the caries rates from these studies-more than were mentioned in the entire 'bibliography' of the report of the New Zealand Commission of Inquiry (1957).

(**54, 59**) Mr Fuller said 'They accuse the Canadian workers of failing to devise a randomisation procedure that would eliminate bias'. The original statement (p. i) refers to 'bias on the part of the examiners' and is not restricted to the studies conducted by 'the Canadian workers'. This reviewer says (**59**) that 'These two booklets together show that great care was taken to introduce a well-designed randomisation procedure'. However the only randomization procedure mentioned in these booklets was related to the sampling process and was used to determine whirls children should be included in the study-it had nothing to do with the elimination of examiner bias. In order to eliminate such a bias it is necessary that the examiner does not know whether each of the children he is examining belongs to the test or to a control city (p. 9). As the examinations in Brantford and its control cities were conducted at different times (p. 43) it is obvious that suitable precautions were not taken to eliminate examiner bias.

(**55**) The only omissions of information from tables which were mentioned in Part One (p. 4) were the printing of dashes in the Ontario Department of Health Report (1956). Care was taken (p. 4) not to make the suggestion that these Canadian workers were 'deliberately omitting vital information in some of the tables', but Dr Grainger's remarks (Item nine; **43**) indicate that

the omission of these figures from the Ontario Department of Health Report (1956) was deliberate.

(**56**) As these omissions were made deliberately, the accuracy of the statement, made on page two of this monograph, that 'Bias is suggested by the presentation of some results', is confirmed.

(**57**) In considering the studies in Brantfocd, reference was made to two of the original papers as well as to the figures contained in the tables of the Report of the Ontario Department of Health (1956). This Report was 'A Report to the Minister of Health' and was 'Prepared upon his request by The Division of Medical Statistics'—it was not, as Mr Fuller submits, written 'for public consumption'. Even if it had been, does he suggest that basic figures presented 'for public consumption' should be different from those shown to any other class of reader?

(**58**) Thanks are due to Mr Fuller for drawing attention to this 1955 booklet of Brown, for it was not realized that two slightly different reports, both termed '1955 Report', were issued from the Department of National Health and Welfare study in Brantford. Reference has already been made to this booklet (Brown, 1955) when discussing Item 13 of Dr Grainger's review (**48**).

(**60**) Mr Fuller says that reports from the National Health and Welfare study in Brantford show 'that examiner variability was eliminated as far as humanly possible by the employment of one examiner only'. However, within-examiner variability remains, and (p. 2) neither withinnor between-examiner variability was estimated in this or any of the other studies considered.

(**61**) Mr Fuller does not specify the 'information alleged to have been omitted' to which he refers here. As he is speaking of Part One, it is assumed that he means the statement made (p. 2), in regard to the five trials considered, that 'The importance of random variation in the D.M.F. rate (decayed-missing-filled permanent teeth rate) does not appear to have been recognized, or else it has been ignored.' (Other 'omissions' have just been considered under comments **54**, **55** and **60**.)

In 'the tables in the 1955 report' (Brown, 1955), mentioned by Mr Fuller, the mean caries rates and the standard errors of the mean rates were shown, with notations which indicated the 'levels of statistical significance'. (Similar data were shown by Brown et al., 1953, 1954b.) In the test city,

nine out of the twelve 'Inter-Year' changes in the D.M.F. rates were said to be significant. However, the strange result was indicated that most of the changes in the control cities were also said to be significant (Brown, 1955). In Sarnia, six out of twelve, and in Stratford, no fewer than eight out of nine changes between successive examinations were said to be significant (ten of the fourteen significant changes in these control cities being indicated as being at the three standard error level). In the first '1955 Report' (Brown, 1955) these changes in the caries rates in the control cities were mentioned, but no reference was made to the fact that most of them were considered to be significant. And as was mentioned (comment 48) in referring to Dr Grainger's Item thirteen, in the second '1955 Report' (Brown et al., 1956) all mention of these changes was deleted.

(**63**) Mr Fuller said that 'The full official report on the Brantfnrd study was available in New Zealand, incidentally, when the Commission of Inquiry held its hearings' (in 1956-7). In that case, and in view of the importance that he appears to attach to this 1955 booklet of Brown (53, 58-61), it is surprising that, as recently as 1959, he ignored it when giving a lecture to the New Zealand Institution of Engineers (Fuller, 1959). On that occasion he said: 'In this age group there has been a 69% reduction in dental decay. The enamel of the teeth of these children has developed under the complete influence of fluoridation and we have a situation the same as that found at Sarnia [air], a situation that verifies the caries/fluorine hypothesis' (Fuller, 1959).

This '69% reduction in dental decay' was shown in the 1954b report of Brown et al., but this very impressive result was a transitory one (pp. 46-7). The chart depicting the D.M.F. rates in this study, which was shown to the Institution, was also taken from that report. Why did Mr Fuller rite the most favourable result from this study and ignore the final report (the booklet by Brown, 1955) which shows that, in these children in Brantford, there was considered to be a highly significant rise in the caries rate during the final year of the study?

(**64-7**) In Part a of the book Sutton continues in the same vein. He complains that misleading comments are made in some reports, yet his own book contains many misleading statements. For example, he claims that a proper evaluation of examination errors at Grand Rapids has not been carried out, and he doubts the accuracy of caries attack rates in test and control areas because x-ray examinations

> were incomplete or absent(65). It is significant that he omits to refer to a report by Hayes, McAuley, and Arnold published in the U.S. Public Health Report in December, 1956, which is a key reference in this subject(**66**). This report met the specific point that 'some observers have suggested that x-rays are essential to determine the efficacy of caries control measures' and an investigation was undertaken 'to detemine whether or not supplementing direct observation with x-ray examinations would affect the conclusions based on direct observation alone.' The conclusion was that supplementary x-ray examinations supported the clinical findings and did not change the basic observation that substantial decreases in dental caries occurred during the test period. The very standard errors that Sutton demands for a proper statistical evaluation were available in this report(**67**),

Comment. Mr Fuller seems to suggest that(**64**) examiner errors for the Grand Rapids study were given in the paper of Hayes, McCauley and Arnold (1956)-this is not the case. In speaking of that paper, he stated (**67**) that 'The very standard errors that Sutton demands for a proper statistical evaluation were available in this report.' In the first place, standard errors were not demanded, indeed they were not even mentioned in the discussion on the Grand Rapids study.

Secondly, the paper by Hayes et al. (1956) deals with clinical and X-ray examinations made on small numbers of children, from 'four selected schools', in 1946, 1947 and 1953. The children were grouped into three age ranges-five to seven, eight to ten, and twelve to fourteen years. Out of the 11,012 'continuous resident' children of those ages examined in Grand Rapids in those three years, only 736 (less than seven per cent) were X-rayed and included in this study.

This paper showed the caries rates as D.M.F. permanent teeth per child for only the age range of twelve to fourteen years, a range which was not used in the other reports from the Grand Rapids study (Dean et al., 1950; Arnold et al., 1953, 1956). Hayes et al. said that 'Left and right posterior bite-wing radiographs were made for every pupil. For each fourth-grade child (8-10 years of age), one anterior bite-wing X-ray was made to show the central incisor teeth'. However, despite that statement, they did not publish any results for the premolars, canines, and incisors of children under the age of twelve years.

The three main reports from Grand Rapids (Dean et al. 1950; Arnold et al., 1953, 1956) were concerned with two types of caries rate: the D.M.F. permanent teeth per child and the d.e.f. deciduous teeth per child at each year of age, from four to thirteen years for the deciduous teeth and from six to sixteen years in the case of the permanent ones. None of these rates, nor their standard errors, were shown by Hayes et al. (1956), so that this study was disregarded. It is clear, therefore, that Mr Fuller's suggestion(**61**), that the standard errors for these Grand Rapids reports were shown by Hayes et al. (1956), is incorrect and misleading.

Mr Fuller stated(**65**) that the author 'doubts the accuracy of caries attack rates in test and control areas because x-ray examinations were incomplete or absent.' This remark refers to the statement made on page sixteen: that the lack of X-ray examinations 'must throw considerable doubt on the accuracy of the caries attack rates'. This remark is borne out by results published by Blayney and Green (1952) and by Ast et al. (1956). Also, in the paper cited by Mr Fuller (Hayes et al., 1956) it was stated that 'The combined technique, direct observation plus bite-wing roentgenography, consistently yields a higher estimate of caries prevalence than direct observation alone'. This remark, far from disagreeing with the statement made on page sixteen to which Mr Fuller takes exception, in fact confirms its accuracy.

Mr Fuller(**66**) is confusing two different matters: assessment of changes in caries rates and accuracy of caries rates. He says that it is 'significant' that no reference was made to the paper by Hayes et al. In this, attention was drawn to the fact that observers had 'suggested that X-rays are essential for dental surveys designed to determine the efficacy of caries control measures'. In order that the results from the Grand Rapids study, which were based essentially on clinical examinations, could be regarded as reliable, it was necessary to establish that the absence of Xray examinations did not invalidate the findings. The aim of the investigation by Hayes et al. was to determine whether different conclusions regarding changes in caries rates in a study would have been reached if each examination had been supplemented by an X-ray assessment instead of using clinical examination methods alone. This is a different matter from that of the accuracy of caries rates which was mentioned in comment **65** and which was the subject under discussion in the second paragraph of page sixteen.

(**68**) He quotes a subsequent (1957) paper by McAuley that suits his book, and, in the light of his criticisms and allegations, this makes the omission of any reference to the 1956 report more damaging. To borrow his own phrase, omissions of this nature render his work 'open to doubt.'

Comment. Mr Fuller refers to a 1957 paper by McAuley'. It is thought that he means the 1957 paper of McCauley and Frazier which reports on a caries survey in Baltimore. This paper was mentioned because it provided a recent example demonstrating the marked differences in caries rates which may be attributable to examiner variability (p. 9), and because it provided a recent opinion which had a bearing on the action of fluorides (p. 8). Mr Fuller refers to 'the omission of any reference to the 1956 report' of Hayes, McCauley and Arnold. Although a photostatic copy of that report was obtained, prior to preparing the comments on the Grand Rapids trial (pp. io-i5), the data given in it were not mentioned for the simple and, it would have been thought, obvious reason that the type of data considered in this monograph is not mentioned by Hayes et al. (1956) (see comment 67). Therefore it is ludicrous to refer to this omission as 'damaging' and as rendering the work 'open to doubt.'

(**69**) Sutton criticises his overseas colleagues for their inability to examine children in control towns prior to fluoridation. With personal experience of a study of this nature he would appreciate that where on the one hand the interests of a large number of people and their local bodies and institutions are concerned as compared with only one or two examining personnel on the other, it is almost impossible to operate a plan to the exactitude dreamed of at the statistician's desk.

Comment. The incorrect statement (pp. 64-5) of the United Kingdom Mission (1953), that 'Before fluoridation is started the teeth of the children in both [test and control] towns are examined in detail', was criticized but not the 'inability to examine children in control towns prior to fluoridation.' Mr Fuller suggests that the failure of these workers to conduct prefluoridation surveys in the control cities was due to their 'inability' to do so. It will be recalled that the consequences of this failure were particularly obvious in the Evanston trial (pp. i6-si; Fig. 3, p. 22). As Mr Fuller must be aware, in his own country there was a similar failure to conduct an examination in

the control city of Napier prior to fluoridating the water supply of Hastings. In the first report from that project (Ludwig, 1958) the caries attack rates in Napier were not published, but it was stated that 'the two cities were not comparable'; as a result, the original plan of this project, to use Napier as the control city, was abandoned.

The Dental Health Division and Research Division of the (Canadian) Department of National Health and Welfare (1952) said that, using only one examiner, 'the examination of, say, 1,600 children spread over, say, 20 schools can be accomplished in a matter of, at most, 4 weeks, including follow-up.' Therefore it is obvious that it was not a question of their 'inability to examine children in control towns prior to fluoridation' but of a lack of appreciation of the necessity for such a procedure (p. 65). If this necessity had been recognized, it would have been illogical to jeopardize such long-term experimental studies by failing to delay the commencement of fluoridation by the short period required to assess the caries rates in the children in the control area.

(**70**) In any event, the criticism is rather meaningless as far as the Grand Rapids study is concerned when we realize that the base-line examination in the control city of Muskegon showed that caries prevalence in that city is of the same order as in Grand Rapids.

Comment. Mr Fuller mentions the Grand Rapids trial-the trial which showed the best comparability of caries rates between the test and the control cities. He ignores the 'smoothing' of the initial rates in the Newburgh-Kingston trial (pp. 54-5) and the fact that, at the time fluoridation was instituted in Brantforcl, the degree of comparability of the rates in that city and in Sarnia, its 'fluoride-free' control city, cannot be established (pp. 39, 44). He also ignores the gross differences found in caries rates during the initial examinations in Evanston and its control city (p. 21; Fig. 3, p. 22).

(**71**) In attacking the Evanston-Oak Park study, Sutton bemoans the lack of information about the design of the study and phrases such as 'It is not clear - - .', 'It is not understood - - .', '(It) was not stated - - - ' give the lead to questions and speculations that follow. But why not adopt the simple expedient of writing to the workers concerned and so finding out instead of speculating? This attitude is typical of the book.

Comment. The ten reports from this study which dealt with caries rates, a

total of more than sixty-five pages in journals, provided ample space for the authors of this study to publish details both of their methods and of the results they had obtained. It was felt, therefore, that data which they had not published during the twelve years which had elapsed since it was obtained—such as the caries rates of the younger children attending the different types of school (p. 34) and the caries rates of the deciduous teeth in Oak Park (p. 24)—would, almost certainly, not be disclosed in correspondence. The reasonableness of this assumption has been borne out by the failure of Doctors Blayney and Hill, in their review of this monograph, to mention these, and other, omissions which were pointed out.

(**72-3**) And typical also is the quibbling over details that do not detract one iota from the part that fluoridation has played in these areas in reducing dental decay(**72**). 'The total tooth surfaces considered … should be 58,325, not 58,352' says the author, and also '… the mean of these values for 1946 ... is 150.09, not 149.76'(73), Dear me, Dr Sutton, how dreadful!

Comment. Errors in the tables of a research report may inadvertently appear, but should be rare, and they should be reported and corrected as soon as is practicable. To refer to such errors as 'quibbling over details' indicates that Mr Fuller does not realize, or in this ease does not admit, the need for accuracy in a research report.

The first of the numerical errors mentioned was present in Table XII (Hill et al., 1957a). Mr Fuller omits to mention that, in the same table, the D.M.F. rate per hundred surfaces for the fourteen-year-old children in 1946, which was shown in a previous paper (Hill et al,, iy) as 15,09, was altered to 15.92. As a result of this small change in the caries rate, the percentage 'Differences from 1946' were increased from 1.78 to 6.8 (6.8 should read 6.91) in 1949, and from 7.62 to 12.44 in 1952 (p. 23). No explanation for this change was given-indeed, the fact that a change had been made was not mentioned.

In spite of Mr Fuller's opinion to the contrary, this is a clear example why even small errors in the caries rates should be noted. Small errors or changes in these rates may produce marked changes in the results reported when these are expressed as percentage changes—as is the case in all these studies.

The second error referred to by Mr Fuller, the incorrect rate of 149.76, was originally pointed out on page thirty-one of this monograph. It is the

smaller error of two which arose when the authors of this study altered their original results (p. 30), and is an error in computing the amended rates (p. 31) in the 1952 report of Hill et al. This incorrect figure was repeated in the 1954, 1956, and 1957a reports.

(**74-5**) And then we come to the Newburgh.Kingston stud'. Prominence is given to the different composition @1 the waters at Newburgh as compared with the control riss of Kingston(**74**), and this is cited as the reason why the latter is unacceptable as a control. But once again Suitos omits any reference to a key report, that by Dean, Arnold, and Elvove of August, 1942, listing caries prevalence rates in communities where the variables in the domestic sealer mentioned by Sutton varied to a greater degree than hitween Newburgh and Kingston without caries prevalenie being markedly afferted(75),

Comment. Mr Fuller suggests that the variables in the domestic water are of little importance in a fluoridation study, and, therefore, that the differences (p. 48-9; Fig. 7, p. 49) between the water supplies of Newburgh and Kingston are unimportant. In support of this contention he cites the findings of Dean, Arnold and Elvove (1942). However it is clear that his opinion was not held by Dr Ast, the senior author of the Newburgh study, in 1943 (p. 49) when he emphasized the importance of the comparability of the 'chemical composition of past and present water supply'. Nor was it shared by the American Water Works Association (1949) when they stated that the experimental verification of the fluoride-dental caries hypothesis 'obviously necessitates the use of a nearby "control" city with a water supply comparable in all respects to that to which fluoride is being added.'

It should be noted that not only was the composition of the Kingston water considerably different from that of Newburgh (pp. 48-9; Fig. 7, p. 49) but the authors (Ast et al., 1950) ignored this fact and said (p. 48) that the waters 'were comparable and have remained so, except for the addition of sodium fluoride in Newburgh's supply.'

(**76**) The author complains of bias in the manner in which souse results are presented but, as can be seen, he displays bias himself in the choice of articles he quotes and in his omission to read others.

Comment. Mr Fuller has made the assertion that bias was displayed by the

choice of articles quoted. It is assumed that he meant a bias against literature in favour of fluoridation, but the unreasonable nature of this accusation is obvious when the following facts are considered: There were sixty-seven references given in the first edition of this monograph. Thirty-one of these were to original papers from fluoridation trials, eleven were to papers by authors of fluoridation studies or by strong proponents of this measure, and six were official reports. Of the remaining nineteen, thirteen references were made to statistical or other 'neutral' studies, and only six references were made to papers which could conceivably be considered to question any aspect of fluoridation. Moreover, only brief mention was made to these six papers, about half a page in all, of the seventy-two pages of the text being devoted to them.

It can be seen, therefore, that the observations made in this study of fluoridation trials are founded, almost entirely, upon statements made in the original reports from these trials and by those who advocate this measure.

Mr Fuller's charge, that bias is shown in this monograph, is in direct contrast to the opinion of the reviewer for the Journal of the *Dental Association of South Africa* (15 March 1960) who said that 'The author proves himself to be completely without bias; although he exposes numerous errors, omissions and misstatements in this evidence, he does not condemn fluoridation out of hand.'

(77) It is not surprising, therefore, to see hint fall into the familiar pattern of the antifinoridationist. Those who question fluoridation are given the familiar title of 'eminent authorities,' a distinction not afforded anyone else.

Comment. Those termed 'eminent authorities' (p. 5) were: (a) Sir Stanton Hicks, who, for many years, was Professor of Physiology and Pharmacology in the University of Adelaide, and Scientific Advisor on Foodstuffs and Feeding to the Australian Military Forces. (b) Dr Hugh M. Sinclair, Vice-President of Magdalen College, Oxford, and formerly Professor of Human Nutrition at that University, and his co-author, Dr Dagmar C. Wilson, the author or co-author of many original papers on dental caries and fluorides. (c) The remaining authority mentioned as questioning the safety of fluoridation (p. 5) was the late Professor Harold K. Box who was, correctly, described in paragraph 119 of the Report of the New Zealand Commission of Inquiry (1957) as 'an international authority on periodontal disease'.

It is of interest to note the next paragraph in that New Zealand Report where

mention is made of the paper of Professor Box from which the quotation on page five was taken (Box, 1955). It states: '120. Dr Cunningham, Head of the Department of Periodontology at the Otago University Dental School, produced an article published by Dr Box in 1955 in which he stated: "I have never made a survey of gingival and periodontal diseases in any area where the water was naturally fluoridated ... and I have written or published nothing on this subject." (*Dental Digest*. 61: 172-April 1955.)'

That statement, read without reference to its context, suggests that Dr Box did not express an opinion regarding the possible effects on the periodontal structures of the ingestion of fluorides. However, in the concluding paragraph of that paper, he stated: 'At the present time, the available findings on gingival and periodontal diseases, as revealed by survey, are totally inadequate. It is my considered opinion that the artificial fluoridation of water supplies, on a wholesale basis, should not be advocated or adopted until fully sufficient findings show that there are no harmful sequelae from a gingival or periodontal standpoint.'

This paper was entitled 'Fluoridation and periodontal disease'. It occupied only one page, and the opinion which Professor Box expressed in the concluding paragraph was also shown, in almost the same words, in a summary, its large type, which preceded his paper. As this paper was 'produced' and, presumably, read, the opinion which he expressed in such strong terms could not have escaped the attention of the New Zealand Commission of Inquiry (1957). Therefore it is surprising that that Commission, instead of giving prominence to the opinion of Professor Box, whom it recognized as 'an international authority on periodontal disease', should fail even to mention his 'considered opinion'.

(78) It is surprising, however, to see him serve his ends by quoting Feltman's study on the use of fluoride tablets. This study lacks the very control that one would expect Sutton to consider essential.

Comment. Mr Fuller disparages the work of Feltman on the use of fluoride tablets. However, the New Zealand Commission of Inquiry (1957) said that 'certain preliminary controlled studies by Held & Piguet (1954) in Switzerland and by Feltman (1951) in the United States are promising.' The paper by Feltman (1956), which was quoted on page sixty-six, was stated to be a 'progress report'. His findings (p. 66) were mentioned because

data from the Evanston trial were compatible with a continuous and marked decline in the rate of eruption of the first permaneni molars during the first four to five years of fluoridation (pp aG-fl). Because Feltman's results were only progress ones, and because the authors of the Evanston study, Hill et of., failed to publish this type of data after 1951 (pp. 27, 66; Fig. 4, p. 27) the suggestion inherent in both these results was treated with reserve, when preparing this monograph, and it was stated: 'Of course, if fluoridation results in the eruption rate of teeth being retarded . . .' (p. 66).

It should be noted that no comment was made by Doctors Blayney and Hill (in their review of this book) on this suggestion of a decline in eruption rate, even though it was illustrated in Figure 4 (p. 27).

(**79**) As one would expert, there are no bouquets for the New Zealand Commission of Inquiry, one complaint being that "no mention was made of the employment of a statistician to assist its members in evaluating [the] numerical data." Had the author inquired, he would have been told that the Professor of Biochemistry on the Commission was well versed in biometrics, and that scientific witnesses quickly discovered that tables were unacceptable unless they contained complete details including standard errors, so that he could evaluate data statistically for himself and the Commission.

Comment. If this is so, it is surprising that the Commission (New Zealand Commission of Inquiry, 1957) stated (p. 69) that 'We have found nothing to invalidate the statistics or cast doubt on their reliability.'

(**80**) Finally, a warning to those reading this book, lest they be misled by the polemics and the array of figures. Please note that Sutton's conclusions in part 2 (which forms the greater part of the book) are confined to variations in the prevalence of dental decay in control cities and not to the cities where fluoride has been added.

Comment. The conclusions in Part Two were not 'confined to variations in the prevalence of dental decay in control cities'. Those 'reading this book' will, no doubt, realize-without this 'warning'—why emphasis was placed on these cities, for it is unlikely that they would not have read (p. 5) the title of Part Two: 'Fluoridation trial controls: errors, omissions and misstatements'.

(**81-2**) What of the places where fluoridation has been adopted? Sutton

does not dispute the fact that the prevalence of dental decay has been substantially reduced in the fluoridation cities of Grand Rapids, Newburgh, Brantford, and Evanston(81), nor does he mention that these good results have been confirmed by several independent studies in tin U.S.A., and also in Tasmania, Brazil, Japan, Germans. Sweden, and at Hastings in New Zealand(82).

Comment. The claim that 'the prevalence of dental decay has been substantially reduced' in these test cities, as a result of fluoridation, was questioned in the concluding statements of both Part One and Part Two (Pp. 4, 71). Mr Fuller's statement that these claims were not disputed is incorrect. The fact that he made such a statement supports the conclusion reached in the first comment on his review—that he had read this monograph only superficially.

In December 1958, a list of cities with fluoridation schemes in operation was supplied by the Dental Health Officer, World Health Organization (F. B. Rice, personal communication). In this, no control cities were shown for the fluoridation projects in four of the countries mentioned by Mr Fuller, namely Brazil, Japan, Germany, and Sweden. No control was attempted in the Tasmanian scheme (Brothers, i956). The control for the Hastings project was abandoned, the reason given for this action being that 'the two cities were not comparable since the basic soil type in the Napier area is different to that in the vicinity of Hastings' (Ludwig, i958). As all these artificial fluoridation projects were conducted without controls, it should be obvious why they were not mentioned in Part Two for, as its title states, it considers fluoridation trial controls. The meagre results pubfished (p. 6) from these and other projects cannot be said to 'confirm' the results of the main studies on artificial fluoridation—in any case uncertain results cannot be confirmed.

(**83**) The validity of the results from Hastings, incidentally, has been checked by the Applied Mathematics Laboratory of the New Zealand Department of Scientific and Industrial Research.

Comment. It is frequently not recognized that the validity of results depends not only on the accuracy of the mathematical computations but also on the design of the experiment. In discussing the mechanism of the Evanston trial, Blayney and Tucker (1948) said that 'A study of this nature must have an

adequate control.' The Hastings project has no control for, soon after it was commenced, the control was abandoned.

Sir Ronald Fisher's statement on this subject is of very great importance in considering the results published from all these fluoridation projects (Fisher, igyt): 'If the design of an experiment is faulty, any method of interpretation which makes it out to be decisive must be faulty too.'

CONCLUSION

IN this second edition, consideration has been given to criticism published by five men who, by their close association with fluoridation investigations, should be exceptionally well equipped to comment. It should be noted that these criticisms make practically no relevant comment on the points raised concerning the Grand Rapids and the Newburgh trials, nor on most of the matters mentioned by the author in discussing the Evanston trial.

The Editorial in the February 1960 issue of the *Australian Dental Journal* inferred that the first edition was essentially an 'unearthing' of 'typographical errors, slips in arithmetic and minor inconsistencies'. In the light of the comments made on the criticisms published in these book reviews, the reader must decide whether this inference is a true one. It is pertinent to mention that, in an 'Occasional Survey' published in the Lancet (ta March tgfio) entitled 'Fluoridation: the present position', it was stated that the first edition showed 'that the American trials claim more and prove less than the published results at first suggest.'

In the final paragraph of Part One, the opinion was expressed that 'It is possible that a case for fluoridation can be solidly based'. However, investigation of the published criticisms that have been reprinted here has considerably strengthened the conviction, which was expressed in the Summary of Part Two, that ‘The sound basis on which the efficacy of a public health measure must be assessed is not provided by these five crucial trials.’

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ADDENDUM TO SECOND EDITION

(Published in *The Greatest Fraud: Fluoridation*, by
Philip R.N. Sutton, 1996, ISBN 0949491128, Melbourne University Press
to accompany the reprint of the earlier—1960—book)

Further criticisms and comments.

In the second edition of the monograph Fluoridation. Errors and Omissions in Experimental Trials it was stated that copies of the first edition were sent by the Federal President of the Australian Dental Association to all the men in charge of the trials which had been considered.

As has been mentioned, criticisms by the authors of the Evanston and the Brantford (Canadian Department of National Health and Welfare) studies, were published as "book reviews" in the February, 1960, issue of the Australian Dental Journal.

After the second edition was "in press", the June 1960 issue of Nutrition Reviews was received, containing (Vol. 18, pp. 161-165) a paper by Dr J.M. Dunning entitled "Biased criticism of fluoridation. This paper quoted some passages from "... letters to Dr Kenneth Adamson, President of the Australian Dental Association" from the senior author of the Grand Rapids trial, Dr F.A. Arnold Jr., and from the senior author of the Newburgh trial, Dr D.B. Ast, and some criticisms by Dr J.R. Blayney of the Evanston trial, which had not been published in the above-mentioned "book reviews" in the Australian Dental Journal.

The following pages contain all the passages from those letters which were published by Dr Dunning. In view of the title he gave to his paper, it is considered likely that he cited from those letters the quotations which he considered to be the most important criticisms advanced by the authors of those fluoridation trials.

These comments were prepared in 1960 and had a very limited circulation in roneoed [Gestetnered] form. They have not been otherwise published until now because of the refusal of many editors to accept comments which question fluoridation.

Dr F.A. ARNOLD JR

Dr Dunning said that: "Dr F.A. Arnold, Jr., Director of the National Institute of Dental Research and principal investigator at Grand Rapids, writes in

part as follows (Arnold to Adamson. October 16. 1959)".

The quotation from Dr Arnold's letter which will be considered first is the following accusation (as reported by Dr Dunning):

(84) "Although he [the author of the monograph] did not publish his material until 1959, he (apparently intentionally) overlooked the report of the tenth year of the study which appeared in 1956. As was originally planned, it was this year that we obtained "complete" age groups of adequate size."

Comment. It is difficult to believe that Dr Arnold could have made this extraordinary accusation for, if the monograph is consulted, it can be seen that "...the report of the tenth year of the study which appeared in 1956" the paper by Arnold et al. (1956) - was (a) listed under Dr Arnold's own name in the references, (b) shown, again under his name, in the Index, which indicates that this paper was mentioned on four pages, and (c) was given as the source of the data from which Figures 1 and 2 were compiled (pages 147 and 148). These two figures depict the caries rates reported for each age group in each year in the city of Muskegon up to the time when, as a result of its water supply having been fluoridated, it ceased to be the "fluoride-free" control city for Grand Rapids. (See explanatory notes to Figures 1 and 2, pp. 147 and 148).

If Dr Arnold is correctly quoted by Dr Dunning, it would appear that, before criticizing it, he read the monograph only superficially, even that part of it which relates to his own study. Furthermore, it is clear that, before making the accusation that "apparently intentionally" this 1956 report from the Grand Rapids study had been "overlooked", he failed to check both the list of references and the Index.

If this is not the case, one is forced to conclude that Dr Arnold made this accusation deliberately, knowing that it was untrue, with the intention of misleading the President of the Australian Dental Association.

That author was also reported to have written (85-91):

(85) "He [Sutton] overlooks the fact that one examiner has been with the study throughout."

Comment. This fact was not "overlooked". This can be seen by referring to the monograph, the top of page 144 where Arnold *et al.* were quoted as saying that: "There have been changes in the dental examiners with the exception of one officer who has participated in each series of examinations.

Each new examiner has been calibrated against this one officer to standardize diagnostic criteria" (Arnold et al., 1953).

(86) "If we used his findings, we would come up with the same general result."

Comment. As it is unlikely that the findings of this examiner were not used in this study, it is concluded that Dr Arnold is referring to the situation which would have arisen if the data from this study had been confined to those obtained by that one examiner. However, no comment can be made in this matter as in the published data the findings of the examiners were combined.

(87) "Also, we could call attention to the fact that two more of the four examiners used throughout the first ten years of the study started examining during the third year of the study and have participated each year since. "

Comment. Dr Arnold refers to "the four examiners used throughout the first ten years of the study". However, in a note published on the first page of his report of the tenth year of the study (Arnold et al., 1956), he stated that: "The following dental officers of the Public Health Service conduct the annual dental examinations", and named five examiners: Doctors Likins, Russell, Scott, Singleton and Stephan. In addition, he mentioned the names of four other dentists who "also participated as examiners" in the study: Drs Loe, McCauley, Ruzicka and Short. In his 1953 report also (Arnold et al., 1953) he had acknowledged the participation of the same nine examiners not four as Dr Arnold stated in his misleading letter to the President of the Australian Dental Association.

(88) "He criticizes our selecting samples by school grade. If he would realize it, and probably he does, this strengthens the study."

Comment. It is evident that Dr Arnold has changed his views on this matter. When, in 1953, he described the method used (Arnold et al., 1953), he acknowledged that "choosing examinees by grade in this manner will, in some instances, not give well-distributed specific age groupings." But now he says that "... selecting samples by school grade ... strengthens the study."

(89) "In the first place this gives us a random sample."

Comment. In order to be satisfied that the children examined constitute a random sample of those in the city, it is necessary to know if the children

were a random sample of those in their school and, also, that the schools in which the examinations were made were a random sample of those in each city. The method of sampling, as described by Arnold et al. (1953), was stated on page 153. The meagre description that "on the basis of available information" (which was not disclosed) " 25 representative schools were selected" - no description of the method of selection being given - does not permit the reader even to attempt to determine whether or not the schools selected constituted a random sample of those in the city. In the next report (Arnold et al., 1956) it was not stated how many schools were selected, merely that "The annual samples of the school population of Grand Rapids and Muskegon are taken from schools selected as representative of each city as a whole." (See comment 91 below for an independent report on the sampling methods used in this study.)

(90) "Also, it permitted us to examine all the children of a grade without the examiners knowing whether the child belonged to the "continuous resident" group or not."

Comment. This fact was mentioned by Arnold et al. in 1953. However, it is of little consequence, for no comparisons were published between the caries rates in the "continuous resident" group and the other children in Grand Rapids. This statement by Arnold indicates that he realized the need for "blind" examinations. However, he made no attempt to incorporate this vital point in experimental design when he arranged for the examination of the Grand Rapids children and their comparison with those of the control city of Muskegon. The desirable aim of eliminating unintentional bias on the part of the examiners would have been achieved if the children in the test and the control cities had been examined on the same occasions "without the examiners knowing whether the child belonged to the "continuous resident" group in Grand Rapids or the "continuous resident" group in the control city of Muskegon. Unfortunately this was not done.

(91) "The planning of the study and the analysis of the data were done by a group of people all of whom are more knowledgeable in this field of research than is Dr Sutton."

Comment. No comment will be made on this remark (except to say that Dr Arnold has never met me) but it is pertinent to quote another opinion. T.M. DeStefano (*Bull. Hudson County Dent.* Soc, 23: 20-31, Feb. 1954) quotes from the critique of the report of the "seventh Year of Grand Rapids-Muskegon Study" (Arnold et al., 1953) that "... had been sought and paid

for by a group of general practitioners from a reliable statistical firm" (the Standard Audit and Measurement Services, Inc., 89 Broad St., New York 4, N.Y). DeStefano quotes this critique as stating:

> "The authors appear to have demonstrated an unfortunate disdain for some of the pre-requisites of valid research." Also that "In the first place, the sampling design of the experiment is embarrassingly conspicuous by its absence.

Such a brief description as: "On the basis of available information the 31 school districts in Grand Rapids were classified on a socio-economic basis. From the 79 schools in those districts, 25 representative schools were selected and the examiners assigned ... etc." leads one to suspect that the drawing of the sample was dangerously amateurish. This suspicion makes one feel that either the results of fluoridation are so dramatic as to force themselves through the veil of poorly selected samples or "at the other extreme" that the reported results are merely the fiction of a biased sample. From work other than that reported by the authors, one tends to discard the latter possibility but the lack of sophistication shown in selecting the sample leads to complete bewilderment as to the precise effects or the extent of the effect of fluoridation."

This critique by the Standard Audit and Measurement Services continues:

> "With a pre-listed population (such as a school enrolment) there would appear to be no excuse for not using modern sampling tools and procedures. Employment of these devices would enable not only a more certain statement of the effects of fluoridation but (perhaps more importantly) a precise estimate of the error inherent in such statements."

DR D.B. AST

Dr Dunning then said that "Dr David B. Ast, Director, Bureau of Dental Health of the New York State Department of Health, makes the following comments (Ast to Adamson, March 3, 1960)".

Dr Ast is reported to have written (92-7):

(92) "Sutton criticizes the comparability of data among the four studies because in Newburgh and Kingston we used the rate based on DMF per 100 erupted permanent teeth instead of DMF per child."

Comment. Contrary to this statement by Dr Ast, "the comparability of data among the four studies" was not criticized. However, it was pointed out that it is very difficult to compare the results shown in the five reports from Dr Ast's Newburgh trial because of the different methods of presentation of data that were adopted by Dr Ast and his co-workers. Nor was criticism levelled at the use of "the rate based on DMF per 100 erupted permanent teeth"

(93) "We explained why we used the permanent tooth population as the universe considered."

Comment. The paper giving this explanation (Ast et al., 1956) was referred to on twelve pages of the monograph.

(94) "However, in order to make our data comparable to other study data, in the reports for 1953-54 and 1954-55, the Newburgh-Kingston data were given both ways—DMF per 100 teeth, and DMF per child."

Comment. If the aim of Dr Ast and his co-workers was to make the data from their study "comparable to other study data", it is unfortunate that they did not examine the methods used in publishing the data obtained in other studies and publish some tables in which the Newburgh-Kingston data were presented in the form used in these other studies. Owing to this omission, they prevented comparisons being made with the results published in the other studies considered in the monograph by: (a) not disclosing any caries rates for deciduous teeth except in their 1951 report, (b) confining the rate "DMF teeth per 100 children" in 1953-54 to those aged six, seven, eight, nine and ten years (Ast et a1.,1956); (c) combining the 1954-55 caries data into four groups children aged six to nine years, ten to twelve years, thirteen to fourteen years, and sixteen years of age (Ast a a1.,1956). In the other main studies, although the DMF rates were shown per child or per 100 children, either clinical examinations only were used, or the data were reported for individual yearly ages or for age ranges which were different from those used by Ast et al. Thus, comparison of these rates with those published from the Newburgh study cannot be made.

(95) "What is significant and had escaped Sutton is the fact that the percentage differences in Newburgh and Kingston were almost the same for both methods used."

Comment. Dr Ast, no doubt, did not mean to suggest that the results were

almost the same in the test and the control cities, but intended to refer to the percentage differences (in caries rates) between Newburgh and Kingston.

It is surprising that Dr Dunning should have published this remark of Dr Ast, for a paper which he wrote almost ten years earlier (Dunning, 1950) showed that he realized the inadequacy of results stated merely as percentage reductions. In the summary of that paper he pointed out that "Interpretative and other examining errors in DMF studies may be large, easily exceeding 100 per cent differences between samples." He said also that:

> "Illustrations of actual data indicate that the standard deviations of observations about the means (averages) in DMF studies are large even where examining errors are reduced to a minimum." Dr Dunning then said that: "These two sources of variability imply that human DMF studies should be subjected to close scrutiny as to the validity of the data and statistical significance tests applied and reported wherever possible. Mere statements that "caries was reduced by x per cent" are not sufficient."

It can be seen that it is precisely this method of presenting data, that Dr Dunning criticized in 1950, which was used by Ast et al. to report the results from the Newburgh trial: "Mere statements that "caries was reduced by x per cent" (differences between the test and the control cities) without "statistical significance tests applied and reported."

(96) "Another criticism made is that baseline data were collected in Kingston a year after the Newburgh survey. I can't believe Sutton really believes this to be valid criticism. He must be, or should be aware of the fact that caries is not an acute disease of short duration, but a slowly developing one ..."[end of published quotation].

Comment. Dr Ast is wrong in his assumption - it certainly is considered to be valid criticism to point out that the initial examination was not made in the control city until after the fluoridation of the test one. By writing about the obvious fact "that caries is not an acute disease of short duration, but a slowly developing one" Dr Ast avoids the significant point: that he and his co-workers assumed that the caries rates in the children in the control city would be similar to those in the test one, and that they omitted, prior to starting the experiment, to test this vital matter.

(97) "The baseline data in Newburgh and Kingston based on the examination of all the school children age six to 12 in both cities

> were almost identical. All of the examinations were made by the one examiner. Could Sutton really believe that the DMF rate of 20.8 for Kingston, and the 21.0 for Newburgh could have been significantly different if both examinations were made exactly at the same time?..." [end of published quotation]. "... this type of criticism questions not the research but the professional acumen of the critic."

Comment. Dr Ast and his co-workers were fortunate that they were able to present figures for caries rates which were comparable, although the fact should not be forgotten that they improved the comparability between the initial caries rates in the test and the control cities by combining the data from children of different ages.

The workers who conducted the Evanston study made the same assumption and failed to examine the children in the control city until after the fluoridation of the test one (Blayney and Tucker, 1948; p. 153). They were not as fortunate as were Ast et al., for they found "...a lower caries rate for school children of the control area" (Hill et al., 1951). In the younger children, there were gross differences between the initial caries attack rates in Evanston and its control city. The same omission was made in the trial in Hastings, New Zealand. As a result, the control was abandoned, for its caries rates were lower than in Hastings (Ludwig, 1958).

DR J. R. BLAYNEY

Dr Dunning then said that "J.R. Blayney, Director of the Evanston Dental Caries Study, comments thus (Blayney to Adamson, November 23,1959)". Dr Blayney is reported to have written (98-100):

> (**98**) "Dr Sutton ....states, "fhe arbitrary selection of the data which is then termed " representative", instead of making the ultimate findings to be considered valid and reliable, would render a report based on this selective data unfit for serious consideration."

Comment. This "quotation" is inaccurate. Dr Blayney has omitted the words "a section of and refers to "selective data" instead of to "selected data" . The original paragraph was: "However, the process which they described —the arbitrary selection of a section of the data, which is then termed "representative"—instead of making "the ultimate findings to be considered valid and reliable", would render a report based on this selected data unfit for serious consideration."

(**99**) "We feel that this type of criticism is unworthy of the scientific nature and dignity of the University of Melbourne and would tend to imply that the rather reasonable separation of white and Negro, public and parochial children, for the purpose of comparing like with like, is an "arbitrary selection" making the "data unfit for serious consideration" and that the entire report hinges only on this pre-selected data. "

Comment. This comment by Dr Blayney to the President of the Australian Dental Association is misleading. The statement by Hill et al. (1950), which was quoted on pages 151 and 152 and to which the comment made by the author of the monograph refers, made no mention of the "separation of white and Negro, public and parochial school children", but instead, stated the intention of including "... only those groups of children which are representative of the population, with respect to dental caries experience",

Hill and Blayney originally did not intend to separate the children into racial and school groups. It was not until their 1951 report that mention was made that they contemplated such an action, that is, not until a year after they published the statement mentioned above. They decided to separate the Evanston data into racial and school groups when they found that the initial examinations "... indicated a lower caries rate for school children of the control area" (Hill et al., 1951). They have not explained why it was necessary to exclude from the main body of white children those who happened to attend the parochial school, rather than the public one.

As they consider that Negroes have less dental caries than white children it is, of course, reasonable to consider the data of white children separately from those of Negro children. However, Hill et al., first included the data of Negro and parochial school children (with those of the white children attending public schools), then excluded these (Negro and parochial school) data for several years, and then, despite their statement that such a process was necessary, reversed their policy and included these data with those of the white children attending public schools. By this reversal of policy they were able to present initial caries rates for the test city which were more comparable to those in the control city than would have been the case if they had not disregarded their previously-stated policy of comparing "like with like". This cannot be considered to be a reasonable course of action.

(**100**) "We have gathered no secret or concealed data" ...[end of published quotation].

Comment. This assertion by Dr Blayney should be considered in the light of the numerous instances, in his study, in which relevant data were not published, in some cases even for as long as twelve years after they were obtained.

The failure of Dr Blayney and his co-workers to publish these relevant data has, without question, concealed them from readers of their reports.

Dr Dunning quoted two further paragraphs from Dr Blayney's letter. These were printed in the "Book Review" published in the Australian Dental Journal in the February, 1960, issue.

DR J.M. DUNNING

The criticisms made by Dr Dunning himself will not be considered, for his attitude to the monograph and the lack of care in the preparation of his critique are evident from even one example:

He stated that "In discussing requirements for a control, Sutton adopts the position that the control city should be "comparable in all respects" to that where fluoride is being added." That phrase was not used by the author of the monograph, but was quoted by him from two sources (pp. 141, 178, 179,190). His, considerably different, views on this matter were stated on pages 190 and 193.

Therefore, by attributing to the author an opinion which he did not express, and that he actually criticized (p. 190), and by omitting the different opinion that the author did express, Dr Dunning misleads his readers.

Furthermore, the fact that Dr Dunning has elected to publish these extracts from letters written by authors of fluoridation trials, indicates either that he has chosen to ignore or has failed to detect errors in them which should be obvious to a careful investigator.

In 1984, twenty-four years later, Dr Dunning was still criticizing papers which questioned fluoridation. He continued his former technique of misleading his readers by inventing false statements, attributing them to the author of the article he was criticizing, then disputing his own false statements. He stated that Colquhoun (1984):

"... mentions an increase in periodontal disease as if it might have been caused by fluoridation."

In fact, Colquhoun (1984) stated that: "... water fluoridation does not affect" periodontal disease.

Dr Dunning also wrote that:

> "Colquhoun continues to quote Sutton on the subject of defects in early studies of fluoridation, stating that he (Colquhoun) has seen no convincing refutation of this. I offer him my article, "Biased Criticism of Fluoridation" in which I quote the views of several of the leading fluoride researchers of the day. The studies Sutton criticizes most harshly have survived as pioneer efforts and been confirmed not only for their conclusions but for their methodology."

This was the paper in Nutrition Reviews, mentioned above, which has remained unchallenged in print until now, years after it was written, because of the difficulty in having accepted for publication any material which questions fluoridation.

It is interesting that Dr Dunning (1984), after so many years, can call the authors of the original studies:

> "... the leading fluoride researchers of the day".

and say that their methodology had been accepted, when he himself (Dunning, 1950) condemned the method they used of expressing caries changes as percentages without the use of statistical tests.

That Dr Dunning now accepts their methods, such as that used in the Evanston study which led to the authors admitting that they had made gross errors in stating the number of children seen during one examination, one of which was a discrepancy of more than 1000 children shows that he should be included with those described by Professor John Polya (1964) as:

> "... unreliable witnesses before a jury either of scientists or of lay common sense."

It is clear that Dr Dunning's criticisms can be disregarded. He is one of those critics whose intense pro-fluoridation opinions have made them muddled thinkers, and he is one who intentionally manufactures incorrect statements about those he criticizes to try to attack work which he cannot find grounds to fault by legitimate means.

ADDITIONAL OBSERVATIONS ON THE EVANSTON, GRAND RAPIDS AND NEWBURGH TRIALS

1. Gross numerical errors in statements of the number of children examined.

The Evanston Trial

These comments on the Evanston trial were published in 1980 in the present author's book Fluoridation Scientific Criticisms and Fluoride Dangers. It was stated:

"Additional Errors in the Evanston Trial Data.

In January, 1967, which was the twentieth anniversary of the commencement of the Evanston Trial, an entire special issue of the Journal of the American Dental Association was devoted to a report on that study (Blayney and Hill, 1967). In this, the original tables, complete with their gross numerical errors, were reproduced, despite the fact that these [errors] had been pointed out eight years earlier (Sutton, 1959) and some of them had been acknowledged by the authors (Sutton, 1960). In addition, several faulty tables were published for the first time.

The tables [in this issue of the J. Amer. Dent. Ass.] then showed three different statements regarding the number of children aged 6-8 years who were examined in Evanston during the 1946 examination:

(i) 1991 children - see Tables 10, 11,30,40 and 47.
(ii) 1985 children - see Tables 7,8,16,18,21 and 32.
(iii) 1754 children - see Tables 24 and 25.

There were also no fewer than six different statements in that article of the number of children aged 12-14 years examined in Evanston in 1946:

(i) 1703 children - see Tables 15 and 32.
(ii) 1702 children - see Table 47.
(iii) 1701 children - see Tables 11,30,41,44 and 45.
(iv) 1697 children - see Tables 7,9,12,13,17,19,22 and 31.
(v) 1556 children - see Table 26.
(vi) 1146 children - see Table 46.

Between the sum of the two highest statements of the number of children examined in Evanston in 1946, and the sum of the two lowest statements of children examined in the same year in the same study in the same city, there

is a difference of 794 children (1991 + 1703 - 1754 - 1146 = 794).

The number of children stated to have been examined in Evanston is even more divergent in the original papers than in this special article. Blayney and Tucker (1948) and Hill et al. (1950) both gave a figure of 4375 children, compared with the number of 3310 in Hill et al. (1957b), a difference of 1065 children.

It was these differences which the medical journalist Anne-Lise Gotzsche, in a letter to the Lancet in 1975, said that she had showed to workers in other fields, and that they had "simply laughed" at the statistics (see Fig. 5, p. 167).

In that book (Sutton, 1980)—prepared as a submission to the Committee of Inquiry into the Fluoridation of Victorian Water Supplies (1980)—it was stated (p. 203):

"These errors were mentioned [by the present author] 12 years ago to the Tasmanian Royal Commission on Fluoridation. Since that time I have not heard of any mention of them or of a criticism having been made of the numerical data published in that report."

It appears that, in the manner common in fluoridation trials, those erroneous tables have been accepted at their face value, without investigation.

More than thirty years ago it was pointed out (Sutton and Amies, 1958b) that:

> 'This uncritical attitude to these studies is rife." "Also it has been assumed that associations and individuals that ... accepted the responsibility of publicly advocating fluoridation, have undertaken independent examinations of the data, and not merely repeated the opinions of others."

This situation was referred to by Professor John Polya (1964) in his book *Are We Safe?* He wrote:

> "It is immaterial that other evidence in favour of fluoridation is not always false; the point is that persons, bodies and arguments that knowingly or in simplicity acquiesce in one blatant falsehood are unreliable witnesses before a jury either of scientists or of lay common sense."

He continued:

> "The scandal created by the exposure of this absurdity resulted in

> the admission that the first figure (4,375) was correct. In defence of the other claims it was explained that "out of range" children were eventually excluded from the survey, but then further critical check revealed more numerical inaccuracies, not to speak of the magnitude of a correction exceeding 1,000. In better examples of scientific work the author sticks to his experimental group; discarding on the scale quoted strongly suggests that the experiment had to be altered to fit pre-conceived results. This is one of the common consequences of working without control of observer bias."

It is pertinent to point out that, in the Foreword to that article in the special edition of the Journal of the American Dental Association, in January 1967, Dr F.A. Arnold, Jr., the Assistant Surgeon General, Chief Dental Officer, U.S. Public Health Service (and formerly the chief experimenter in the study in Grand Rapids) stated:

> "Here, in a single report, are data on the effect of water fluoridation on dental caries so completely documented that the article is virtually a text book for use in further research. It is an important scientific contribution towards the betterment of the dental health of our nation. It is a classic in this field."

It is indeed a classic - a first-class example of the errors, omissions and misstatements which abound in the reports of these fluoridation trials.

2. False information in the Abstracts of papers

The abstracts of reports on fluoridation trials are unusually important, for it is likely that lay people, and politicians in particular, will confine their reading of the report to the Abstract, assuming that it accurately reflects the findings, and will base their opinions and actions on its statements.

The Grand Rapids Trial. The final report of the Grand Rapids study was published in 1962. Reading the Abstract which preceded the body of the article it would seem that, at last, the authors (Arnold et al., 1962) had come to realize the necessity for comparing the results from the test city with those from the control one for they stated that the results had been "...compared with the caries attack rates in the control group of children in Muskegon, Mich." This claim was not made in the body of the article, which included the statement that: "... fluorides were introduced to this [Muskegon] water supply in July, 1951" Therefore at that time Muskegon ceased to be a control

city, some eleven years before this final report (Arnold et al., 1962) from Grand Rapids.

How then, in 1962, could the final result from the test city be compared with data from a non-existent control one?

The claim of Arnold et al. (1962) that they compared the Grand Rapids caries rates with those in the "control group of children in Muskegon, Mich." is shown to be false by their statement that: "...in subsequent [after 1954] analyses of Grand Rapids data, comparison has been made with the original Grand Rapids findings and with those for Aurora."

This is confirmed by the statement in the Abstract that:

> "Caries attack rates were lowered by 57 per cent in children 12 to 14 years old in 1959." This figure of 57 per cent is obtained by averaging the figures of 57.0, 63.2 and 50.8 per cent for the ages of 12, 13 and 14 years shown in their Table 2 to be the "per cent reduction in DMF teeth (19441959)" in Grand Rapids (not between Grand Rapids and its control city of Muskegon).

The Newburgh Study. Similar mis-information regarding comparisons being made between test and control cities was published in the same year (1962) by Dr David Ast, the senior author of the Newburgh study. In the Abstract of that paper (Ast and Fitzgerald, 1962) he wrote:

> "Among children 12 to 14 years old in the four study areas, reductions in the DMF rates as compared to the rates in control cities ranged from 48 to 71 per cent."

Table 2 is the only one in that paper showing DMF rates for children aged 12-14 years (in one case 13-14 years). In the first two studies listed, Grand Rapids and Evanston, no reference is made to a control, the "reduction" in Evanston, shown as 48.4 per cent, is obviously the 48 per cent mentioned in the Abstract. This "difference" is between the rates in Evanston in 1946 and 1959, not between Evanston and a control, as stated in the Abstract. The Grand Rapids rates are also shown between that city in 1944-45 and 1959, no control data being used. Indeed Ast and Fitzgerald stated in the main text:

> "In the Grand Rapids and Evanston studies the control cities were lost before the study was completed, so that the current data have been compared with the base line data."

Not with control cities, as they stated in their Abstract.

There should not have been any confusion regarding the use of the term "control", for the co-author of that paper, Bernadette Fitzgerald, was described as the "senior biostatistician, division of special health services, New York State Department of Health." Therefore the authors' incorrect statement that they compared the caries rates "in the four study areas" with rates in control cities is unlikely to have been made inadvertently.

3. Continuing publication of false statements.

It has just been shown that Dr Ast (the senior author of the Newburgh study) and Dr Arnold (the senior author of the Grand Rapids study) continued to disseminate false statements regarding their studies many years after those ten-year studies were concluded, Also, the arrogance of Drs Blayney and Hill (the authors of the Evanston study) in publishing an article in 1967, which repeated, in a special issue of the Journal of the American Dental Association, figures which they had acknowledged seven years earlier were faulty (Sutton, 1960), indicates the reckless disdain of all those authors for the truth, and for the members of the scientific community (which normally trusts statements made in established journals by senior scientists, for it is not used to being misled by such readily-verified deceptions).

Their false statements do not engender confidence in the reliability of the data published and the statements made by those senior scientists in their original reports of what are still regarded by fluoridation advocates as three of the four main fluoridation studies on which the case for fluoridation mainly relies - those in Newburgh, Grand Rapids and Evanston in U.S.A.

Commenting on the Grand Rapids study, Ziegelbecker (1983) pointed out that the experimenters had examined "all" children from 79 schools in Grand Rapids at the commencement of the trial, but that:

> "After 5 years in 1949 they selected children at only 25 schools in Grand Rapids for their investigation and observed children at the same time at all schools in Muskegon (the control city)."

For instance, the number of children aged 12 to 16 years who were examined in Grand Rapids at the commencement of the trial was 7,661, but only 1,031 were examined in 1959 (Arnold et al., 1962).

In 1988, Colquhoun stated:

> "In the control city of Muskegon all children were examined throughout the period. From the year-by-year figures for six-year-olds which were published three years later in 1953, it is revealed that an impossible 70.75% reduction was recorded in the first year of the trial (Arnold et aL,1953) and that there was then an increase and no overall reduction in the following years. Examination of similar data for other age groups shows that the sample of 25 schools could not have been representative of the population being studied."

He pointed out that:

> "The reported DMF of several of the age groups in this sample, approximately one year after the initial examinations, was lower than that of the same children when they were a year younger."

He concluded:

> "Fluoridated water cannot turn decayed, missing or filled teeth into sound ones. It follows that the caries experience of the children had not been reduced as claimed. The large recorded reductions, which were mostly in the first year only, were a result of selection of data."

4. Fictional results?

In 1954 De Stefano reported the findings of professional statisticians regarding the Grand Rapids study. They raised the question whether "... the reported results are merely the fiction of a biased sample."

Ziegelbecker (1983) also, studied this situation. He stated:

> "We must conclude from this result that the sample in Grand Rapids was not representative for all children and with respect to the basic examination. In the following years from 1946 to 1949 (and later to 1954) the 25 schools in the sample were the same each year and we see that the caries experience in the sample was not reduced by fluoride in 1946-1949.

If we accept that the sample was representative for the children, aged 6, in the 25 schools in those years then we must conclude that fluoride in the drinking water had not reduced the dental caries experience of children, aged 6, in Grand Rapids in the years before the US Public Health Service

released the policy statement [endorsing fluoridation] to the American Dental Association."

He concluded:

> "We must conclude from these results that a fluoride content of 1 ppm in the public water supply does not reduce dental caries experience."

Colquhoun stated in 1988:

> "In their final study in Grand Rapids, published in 1962 after 15 years of fluoridation, American health officials [including the director of the U.S. National Institute of Dental Research, Dr F.A. Arnold, Jr.] wrote: "... no such dramatic and persistent inhibition of caries in large population groups had ever been demonstrated by any other means than fluoridation of a domestic water supply."

Colquhoun commented:

> 'That statement, which could be described as the dogma of fluoridation, is now considered by an increasing number of critics to be unscientific and untrue."

In view of the disclosure of the types of error which have just been mentioned, such a grandiose claim, although it was widely accepted at the time, can no longer be considered to be true.

More than thirty years ago Sutton and Amies (1958a) commented on this sudden initial decrease in caries reported from Grand Rapids (and from other studies considered). It was stated that the results reported were not those which would be expected if the hypothesis was correct that fluoride "strengthens" developing teeth and makes them more resistant to attack by caries. Despite the fact that the results published from fluoridation studies do not support this hypothesis, it is still mentioned. For instance, the ten members of the task group which in 1984 wrote the latest WHO book on this subject: Environmental Health Criteria 36. Fluorine and Fluorides, referred to the importance of "lifelong consumption" of fluoridated water.

GLOSSARY

APPROXIMAL SURFACE

Adjacent surfaces of teeth in the same jaw (upper or lower)

"BLIND"

See Examinations "Blind"

CALIBRATIONS

Readings or assessments made in appropriate units

CARIES

Progressive decay of teeth (or bones). See Dental Caries

CARIES EXPERIENCE

The extent and severity of dental caries within a population - usually measured with indexes such as DMFS or DMFT etc.

CARIOGENIC SUBSTANCE

One which produces decay (within a tooth).

CARIOSTATIC

Decay retarding

DECIDUOUS TEETH

(Primary or "milk" teeth). These start to erupt around 6 months and are shed around 12 years when the permanent teeth start to appear.

DEMINERALIZATION

Reduction of the mineral content (principally, calcium and phosphorous) of a (issue, notably the enamel, dentine or cementum of teeth.

DENTAL CARIES

Disease of the teeth resulting in the demineralization, cavitation and breakdown of calcified dental tissues (enamel, dentine or cementum) by microbial activity.

DENTAL DECAY

See Dental Caries

DENTAL FLUOROSIS

A disturbance of tooth formation caused by fluoride being present in the tissue fluids over a prolonged period during tooth development. The disturbance results in the development of porous enamel which has an altered appearance ranging from the most mild forms, in which small flecks of white discolouration can be observed on the tooth surface, to the most severe forms, in which the enamel develops pitting and brown staining. Dental fluorosis must be distinguished from other disorders of enamel including: enamel opacities (see below) of non-fluoride origin; early `white spot' caries lesion; enamel hypoplasia; amelogenesis imperfecta; dentinogenesis imperfecta; and tetracycline stains.

DENTAL PROPHYLAXIS

The prevention of dental disease, especially dental caries.

DENTRIFICE ("TOOTHPASTE")

A pharmaceutical compound used in conjunction with the toothbrush to clean and polish teeth. It contains a mild abrasive, a detergent, flavouring agent, binder, and occasionally deodorants and various medicaments designed as caries preventives, for example, fluoride and antiseptics.

DENTITION

Natural teeth in the jaws

DEF, DMFT, DMFS, DIMFT, def, dft, dfs, dmft

Indexes describing the dental caries experience of individuals or populations. The DMFT index is computed by summing the number of permanent teeth which are Decayed, Missing or Filled. For any person, the index can range in value from zero to 32, the maximum number of teeth. The DMFS index is a count of the number of permanent tooth surfaces which are decayed, missing or filled. Teeth may have either four surfaces (incisors and canines) or five surface (premolars and molars) for the purposes of the DMFS index.

The DIMFT index includes, in addition to a count of decayed, missing and filled teeth, the number of teeth which are Indicated for (in need of) extraction. (DEF decayed, extracted, filled)

Lower case lettering refers to the deciduous dentition. Hence the dft index is count of the number of deciduous teeth which are decayed or filled, while the dfs index refers to the number of surfaces affected. Missing deciduous may also be included in the index, hence constituting the dmft index.

DISCRETIONARY FLUORIDE

Any form of fluoride which is used actively and preferentially by an individual in the prevention of decay. This includes fluoride tablets or drops, fluoridated toothpastes or mouthrinses, and professional topical applications. It does not include fluoridated drinking water.

DOSE (Fluoride)

The amount of fluoridated water drunk, consumed, ingested, by each person. This "dose" differs enormously depending on age, weight, size, state of health, temperature of day, different types of work and sport played etc.

EFFICACY

The extent to which a specific intervention, procedure, regimen, or service produces a beneficial result under ideal conditions. Ideally, the determination of efficacy is based on the results of a randomized controlled trial.

ENAMEL DISTROPHY

Defective formation of tooth enamel (or deterioration)

ENAMEL OPACITY

An opaque area on the normally transparent (translucent) enamel (often referred to as "mottled" teeth)

ENDEMIC AREA

Present within a localized area or peculiar to persons within such an area.

ERROR

BETWEEN-EXAMINER ERROR - variations between the assessments of two different examiners when the examining the same person.

WITHIN-EXAMINER ERROR - an examiner may record different opinions when examining the same mouth on different occasions.

EXAMINATIONS "BLIND"

Are carried out to avoid bias. The examiner should be unaware of the background or treatment of his patient.

EPIDEMIOLOGY

The study of the distribution and determinants of disease in human populations and the identification and evaluation of methods of preventing or alleviating illness.

EPIDEMIOLOGY - EXPERIMENTAL

A study in which a population is selected for a planned trial of a regimen 'whose effects are measured by comparing the outcome of the regimen in the experimental group with the outcome of another regimen in a control group. In some experiments, for example, fluoridation of drinking water, whole communities have been allocated (usually non-randomly) to experimental and control groups.

EVALUATION

A process that attempts to determine as systemically and objectively as possible the relevance, effectiveness, and impact of activities in the light

of their objectives. Several varieties of evaluation can be distinguished, for example evaluation of structure, process and outcome.

FISSURE

A minute crack in the surfaces of a tooth (caused by the imperfect joining of enamel during development).

FISSURE SEALANT

An adhesive, plastic film applied to those surfaces of teeth which have pits or fissures to assist in the prevention of caries - however this film does not tend to last as long as prophylatic fillings.

FLUORIDATION

Is achieved by the mechanical addition of fluorides to a public water supply to attain a concentration of approx. 1 part fluoride to one million parts of water (lppm) (see also RATE) FLUORIDE COMPOUNDS Used to artificially fluoridate water supplies. They are derived from industrial processes and dissolve readily in water.

FLUORIDES

Are substances containing fluoride ions which are constituents of the element fluorine.

FLUORIDES (NATURAL)

Natural fluorides found in nature are those found in which the fluoride ions are bound to calcium and are very insoluble.

FLUORIDE VEHICLE

The means by which supplementary fluoride is provide for the prevention of dental caries. The principal fluoride vehicles are : water fluoridation, fluoride tablets or drops, fluoride toothpastes or mouthrinses, and professional dental applications.

FLUORINE

Is a rare and toxic gas (yellow, pungent), however the term fluorine in most cases can be substituted for fluoride (mainly European use).

FLUOROSIS

Fluoride poisoning due to ingesting or drinking too much fluoride in drinking water over a long period of time (or to ingestion of pesticides containing fluoride salts). Chronic fluorosis results in the "mottling" of (children's) teeth.

FLUOROSIS Dental - See Dental Fluorosis

FLUOROSIS Skeletal - See Skeletal Fluorosis

GEL (Fluoride gel)

Contains 1.23% Fluoride for direct application by dentists to teeth during prophylatic treatment.

GINGIVAL SURFACE

That part of the tooth surface which is adjacent to or immediately above the gum (gingiva).

HYPOPLASIA

Incomplete development of an organ or part.

INCIDENCE

The number of new cases of a given disease or other condition in a given population at risk of the disease during a designated time. The word is often used to mean incidence rate.

MFP

Monofluorophosphate - one formulation commonly used for the addition of fluoride to toothpaste.

MOTTLED TEETH

See Enamel Opacity and Dental Fluorosis

MOUTHRINSE, MOUTHWASH

A mouth rinse possessing cleaning, germicidal, and / or palliative properties.

OCCLUSAL SURFACE

The "biting" surface of the tooth which makes contact with that of the opposing jaw.

OSTEOPOROSIS

Porosity and brittleness of bones due to loss of protein from the bone matrix.

PERMANENT DENTITION

The set of natural, permanent teeth in the dental arches.

PPM

Parts per million - a measurement of the concentration of a substance. A concentration of one part per million is equivalent to one milligram per kilogram. For example, fluoridated water at 1 ppm contains one milligram of fluoride ion per litre of water.

PREVALENCE

The number of individual cases of a given disease or other condition in a given population at a designated time. The word is often used to mean prevalence rate.

PRIMARY DENTITION

The set of natural, primary (deciduous) teeth in the jaws.

PROPHYLATIC FILLINGS

Dental fillings which, in the past, were placed in the pits or fissures of sound (non-decayed) teeth with a view to preventing the development of advanced decay.

PROTOPLASMIC POISONS

Fluorides are generally protoplasmic poisons because of their capacity to modify the metabolism of cells by changing the permeability of the cell membrane by inhibiting certain enzyme systems.

PUBLIC HEALTH

Encompasses the problems affecting the health of a population, the collective status of health of the people, environmental health and health services, and the administration of health care services.

RANDOM VARIATION

This term is used to describe the differences which may occur constantly from year to year in treated or untreated areas due to the influence of many random factors which affect caries rates, some of which are unknown.

RANDOMIZED CONTROLLED TRIAL

An epidemiological experiment in which subjects in a population are randomly allocated into groups, usually called "study" and "control" groups, to receive or not to receive an experimental preventative or therapeutic procedure or intervention. The results are assessed by comparison of rates of the disease, death, recovery, or other appropriate outcome in the study and control groups, respectively. Randomized controlled trials are generally regarded as the most, scientifically rigorous method of hypothesis testing available in epidemiology.

RATE

The amount of fluoride (F) in the water either naturally or added by a water authority expressed as p.p.m. (parts per million) or mg/litre (milligrams per litre)

REMINERALIZATION

The process whereby a demineralized or hypomineralized tissue takes up minerals again (used here in the sense of ionic exchange in enamel).

SKELETAL FLUOROSIS

This is caused by excessive intakes of fluoride from many sources including drinking water supplies. Bone fractures caused by fluoride changing the structure and decreasing the tensile strength (although increasing bone mass). Advanced skeletal fluorosis is a crippling process causing stiffness of joints and limiting joint movement.

SMOOTH SURFACE CARIES

Dental caries occurring on those gingival and approximal surfaces of the teeth which do not have a natural pattern of fissures, pits or grooves.

SUPPLEMENTARY FLUORIDE

Any form for fluoride which is used by humans in addition to the amounts to which they would be exposed through the environment, foods and background levels in drinking water (typically at a concentration of 0.3 ppm fluoride or less). Sources of supplementary fluoride include fluoridated drinking water, fluoride tablets or drops, fluoridated toothpastes or mouthrinses, and professional dental applications. Hence, the term "supplementary fluoride" here is broader in scope than that used by some others to refer only to tablets or drops.

SYSTEMIC

Affecting the whole body.

TABLETS

See Discretionary Fluoride, Supplementary Fluoride and Fluoride Vehicle.

TOPICAL

Pertaining to or acting upon a particular surface area.

TOPICAL APPLICATION

Application locally (in the mouth onto the tooth surface).

TOPICAL FLUORIDE

The application of fluoride which is intended primarily to act locally on the teeth.

TOXICITY

The fluoride ion is toxic to all life when not "bound" (as when it occurs naturally). "Free" fluoride ions may exert toxic effects.

This glossary has been compiled from the work of Dr.P R.N.Sutton, Glen S.R. Walker, The Collins Dictionary and portions of information from the N.H. and M.R.C. (Australia).

§§§

Sent: Friday, May 25, 2012 11:43 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com
Subject: Canadian Dental Association Position on Use of Fluorides in Caries Prevention

To Mayor Orsi and Orillia Councillors,

I e-mailed the CDA and asked how a family can monitor fluoride intake from ALL SOURCES since it is NOT listed on the ingredients in food and beverage products.

They sent me a form letter stating "**THE AVAILABILITY OF FLUORIDES FROM A VARIETY OF SOURCES MUST BE TAKEN INTO ACCOUNT BEFORE EMBARKING ON A SPECIFIC COURSE OF FLUORIDE DELIVERY TO EITHER POPULATIONS OR INDIVIDUAL PATIENTS. THIS IS PARTICULARLY IMPORTANT FOR CHILDREN UNDER THE AGE OF SIX, WHERE EXPOSURE TO MORE FLUORIDE THAN IS REQUIRED TO SIMPLY PREVENT DENTAL CARIES CAN CAUSE DENTAL FLUOROSIS"**

Please make sure you know how the residents are going to "take into account" their daily intake of fluoride from ALL sources before you decide to fluoridate Orillia's water supply. I can't seem to get a straight answer from the Canadian Dental Association. If you do decide to artificially fluoridate then you must **notifiy the residents and parents** of the CDA's warning as it is your moral and legal responsibility.

Sincerely,

Ruth Bednar

From: Colleen O'Neill
Sent: Friday, May 25, 2012 1:21 PM
To: JASON COVEY
Subject: Water Delivery system

Hi Jason,

Would you please let me know if there are any lead pipes in the water delivery system in Orillia? If so, what percentage would that be? Are there any homes which still have lead pipes for water?

Thanks Jason
Colleen

Sent: Friday, May 25, 2012 6:06 PM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; mfogarty@bell.balcberry.net; Paul Spears; Linda Murray; Andrew Hill; Tony Madden
Subject: Do Not Fluoridate Our City Water

There are so many studies that shows how fluoride is harmful. Many cities have removed fluoride form their water after realizing the health problem that it causes. They are many other ways to prevent dental cavities. Please do not fluoridate our water.

Thanks

Gaia and Dolphin Orion
Sebright, Ontario

From: Marilyn and Steve Goulter
Sent: Saturday, May 26, 2012 11:24 PM
To: JASON COVEY; MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Michael Fogarty; Wayne Gardy; Charles Gardner; Peter Dance; Percival Thomas
Subject: Dr Mercola - excellent summary of the fluoridation SCAM

More scientific references - Fluoridation cannot continue in face of the truth!

See section on how to end fluoridation in the whole of Canada.

The end is in sight!

Steve

Attachment:
fluoride-health-hazards.aspx (video file)

From: Alice den Otter
Sent: Sunday, May 27, 2012 8:46 AM
To: MAYOR EMAIL
Subject: Fluoride

Dear Angelo,

Although I am unable to make the next public forum on fluoride, I would still like to express my hope that Council does not vote in favour of adding fluoride to our water. Even if only a few citizens are concerned about potential adverse health effects, everyone will be exposed to the slight increase in arsenic and lead that even the health officials admit will be part of the process. Unfortunately these elements are cumulative in the body so even a little will add up over time. There is no "safe" minimum amount that can be added to anything.

Would you consider holding a public vote with respect to whether or not to fluoridate the water? I know a lot of people who are opposed to the idea but don't feel qualified to say anything to oppose the health officials.

Best wishes,
Alice

-----Original Message-----
Sent: Monday, May 28, 2012 12:05 PM
To: JASON COVEY
Subject: Dentist with 35 yrs in nonfluoridated practice

I, Dr. Evelyn Elsey grew up in a fluroidated community and have flurosis. I have no cavities!
When I came to Barrie in 78, I was the only female dentist and got many children as patients. I can do 2 fills or maybe 4 fills on a 3 or 4 yr old patient, but 8-12 traumatizes a child for life. The only option is general anaesthetic to do the fillings. Many families cannot afford the cost of the fillings or the general anaesthetic. CINOT only pays 1/3 of the normal cost and most dentists take few or no patients on this programme. Elderly on medications get a cavity per pill they take. People on fixed incomes can't afford to be treated and the trauma of dealing with the finances or the tooth loss is tremendous.
When Dr. Dean Smith bought my practice in 94 he said it all:

"In 1 week in your practice (Barrie) I have done more children then in 6 years in Toronto."
Orillia needs to be fluoridated. So does Barrie.
Evelyn Elsey BSc DDS MAGD

-----Original Message-----
From: Colleen O'Neill
Sent: Monday, May 28, 2012 12:06 PM
To: Andrew Hill; Linda Murray; MAYOR EMAIL; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Wayne Gardy
Subject: For Your Information

Dear Mayor Orsi and Members of Council,

I am sending you a letter I have sent to the Honourable Leona Aglukkaq, Minister of Health, Canada regarding water fluoridation.
I have yet to have questions about water fluoridation answered satisfactorily by Health Canada or the Medical Officer of Health.

All the best,
Colleen O'Neill

Attachment:

From: Colleen O'Neill
Sent: Friday, May 25, 2012 2:07 PM
To: Minister Aglukkaq
Cc: Bruce Stanton MP
Subject: Water Fluoridation

1102 Kitchen SR RR1
Coldwater ON L0K 1E0

May 25, 2012

The Honourable Leona Aglukkaq
Minister of Health
Canada

Dear Minister Aglukkaq:

RE WATER FLUORIDATION
Your letter to me dated May 23, 2012 raises again even more questions. Answers are needed as this is such a serious decision for Orillia City Council to make.

You wrote: "Fluoride added to water in the concentrations available in Canada is considered nutritive as opposed to therapeutic."

I understand that if fluoride is to be described as a nutrient there has to be a clear biological requirement for fluoride and a clear ill-effect in its absence.

How did Health Canada determine that fluoride was a nutrient? Has Health Canada done any tests to determine if a human, if starved of all sources of fluoride for a prolonged period of time, suffers any ill effects anywhere throughout the body?

You wrote: "When intended for drinking water fluoridation, Health Canada does not consider fluorosilicate compounds (hexafluorosilicic acid or sodium fluorosilicate) to be drugs under the Food and Drugs Act." Minister Aglukkaq, hexafluorosilicic acid (HFSA) is HAZARDOUS WASTE when NOT intended for drinking water fluoridation. How can HFSA be identified as "nutritive" in one instance and "hazardous waste" in another? This is linguistic detoxification. Please explain.

You wrote: "Health Canada recommends the use of products certified to the appropriate ANSI/NSF standard to ensure any contaminant is well below any level of concern, based on the maximum use level of the product."
Regarding the ANSI/NSF standard - from the NSF web site - "Health Effects are both American National Standards, which means that the NSF Standards and the processes used to develop them conform to ANSI's requirements for voluntary consensus standards. (www.NSF.org) NSF neither has in its possession, nor is it seeking, any toxicological studies that demonstrate the safety of silicofluorides.

How does Health Canada know that HFSA is "well below any level of concern" when NSF has no toxicological studies demonstrating safety? Has Health Canada conducted any studies or have any evidence that HFSA is safe? Please send me the links to Health Canada studies.

Regarding the co-contaminants arsenic and lead - NSF is not the only and final word on the dangers of these contaminants. In 1999, using NSF's own dilution information (0.43 ppb in drinking water at a dilution of 240,000 to 1) the National Academy of Science and the US National Resources Defense Council found that the typical concentration of carcinogenic arsenic commonly found in HFSA is likely to cause one cancer in 10,000. That result would certainly be classified as an 'adverse health effect'. In addition, fluorosilicic compounds leach lead from pipes and brass fittings which would increase the lead levels in the home. Lead pipes are still being used in older communities and homes.

The NSF web site reports that the Standard 60 is for drinking water treatment chemicals; the "standard addresses the health effects implications of treatment chemicals and related impurities. Both the treatment chemical and the related impurities are considered contaminants for evaluation purposes". Why is HFSA considered a drinking water treatment chemical? Why is NSF Standard 60 being used for HFSA in water fluoridation?

I am shocked that you, as Minister of Health, would permit the addition of fluorosilicate compounds to our drinking water.

I am shocked that you, as Minister of Health, would acknowledge and permit the addition of arsenic and lead in ANY amount to the drinking water of Canadians.

Please, Minister Aglukkaq, take action to prevent fluorosilicic compounds from being used for water fluoridation. They have not been tested and proven safe. You must have this power as there have been many products taken off the market for study.
Sincerely,
Colleen O'Neill

From: Marilyn and Steve Goulter [mailto:goulter255@hotmail.com]
Sent: Saturday, May 26, 2012 11:04 PM
To: JASON COVEY; MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Michael Fogarty; Wayne Gardy; Charles Gardner; Peter Dance; Percival Thomas
Subject: The tide is turning!

Please see attached article and link to the original news release.

The real truth seems to be out!

We will keep up the pressure until fluoridation of drinking water is history country wide - **something this WRONG cannot endure!**

Steve Goulter

http://www.cbc.ca/news/canada/windsor/story/2012/05/24/wdr-fluoride-bill-marra.html

Remove fluoride from Windsor water, utilities chair says

Bill Marra supports recommendation to remove the chemical from water system

The chair of the Windsor Utilities Commission supports removing fluoride from the city's drinking water.

Sometime this summer, Windsor city council will deal with the issue.

A recommendation coming out of a special Windsor Utilities Commission meeting held last February is to stop the practice of adding fluoride.

Coun. Bill Marra chairs the commission's board of directors and supports the motion. He said he's hearing from the public on the issue.

"Obviously a lot has changed in 60 years and what's changed significantly is the opinion of the average person," Marra said. "We're hearing — whether you can call them a vocal minority — there is a very concerted, organized effort out there suggesting to the decision makers that fluoridation should be revisited and that's what we're doing."

Marra said there are alternatives to fluoride in the drinking water. He also said the issue isn't cut and dried.

"There are just a lot of question marks around data and research that's been done; the lack of updated research and some questions around the bodies that have taken position on this without real empirical data to support their argument," he said.

Fluoride Free Windsor, a group of 200 people calling for fluoride to be removed from Windsor's water, praised Marra's stance.

"He seems to really understand the question wasn't about teeth, it was about the other things ingesting fluoride does," Kimberly DeYong said. **"This isn't about teeth. It's about so much more."** DeYong said she and the group is "very optimistic" council will eventually decide to remove fluoride from Windsor's water, mainly because most neighboring communities have already done so. Only Windsor, LaSalle and Tecumseh still fluoridate their water supply.

The cost of adding fluoride to Windsor's drinking water is between $125,000 and $150,000 each year.

Sent: Tuesday, May 29, 2012 8:31 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com; Linda Murray
Subject: DO NOT FLORIDATE MY WATER

To Orillia Mayor and Council

I am a resident/tax payer in the City of Orillia and am opposed to having flouride added to my drinking water. I believe that tax dollars could be better utilized addressing the causes of dental caries with measures that make more sense and are not as risky.
Thank you.

Peggy Mansur
Orillia, Ontario

From: Angie Sumner
Sent: Tuesday, May 29, 2012 1:59 PM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; andrew.hill@sympatico.ca; Tony Madden
Subject: I DO NOT WANT FLOURIDE IN MY WATER

This is my formal request. I do not want flouride in my water. Please vote against the implementation of this toxic substance.

Respectfully,

Angie Sumner, CNP, RNCP

Certified Holistic Nutritionist

"You are what you eat! Feed your body well!"
Telephone 705.259.1959

From: Angie Sumner
Sent: Tuesday, May 29, 2012 5:03 PM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; andrew.hill@sympatico.ca; Tony Madden
Subject: Please read the following research papers.

Dr. Westin Price -http://www.westonaprice.org/environmental-toxins/fluoride-worse-than-we-thought

Health Effects of Fluoridation.http://www.all-natural.com/fleffect.html

Unicef's opinion of fluoride.....http://www.nofluoride.com/Unicef_fluor.cfm

50 reasons to be opposed to fluoridation. http://www.fluoridealert.org/50-reasons.htm

If in doubt...leave it out. There are plenty of arguments against fluoridation. All that I am asking is that you make a well informed decision in your vote.

Angie Sumner, CNP, RNCP

Certified Holistic Nutritionist

"You are what you eat! Feed your body well!"
Telephone 705.259.1959

-----Original Message-----
Sent: Tuesday, May 29, 2012 10:12 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com
Subject: Please don't flouridate our water

Please don't spend tax-payers money on a controversial and unnecessary water treatment.

I absolutely refuse to feed my children more flouride. They receive enough of it in unavoidable and immeasurable quantities in their food, drinks, toothpaste and other sources, and frankly the risks are not worth the questionable benefits. If the water becomes flouridated I will be forced to use a water filtration system. So many Orillians feel the same way, but might not be able to afford the luxury of a filtration system.
This is simply not right.

If the health of Orillians is a concern, that funding could be directed instead to (optional - NOT forced) community programs, grants or other initiatives.

Sarah Thompson
Orillia

From: Greycat
Sent: Tuesday, May 29, 2012 10:46 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com; contactus@ocafaction.com
Subject: Stop the unnecessary fluoridation of Orillia's water and avoid forced medication

Please don't spend tax-payers money on a controversial and unnecessary
water treatment.

I absolutely refuse to feed my children more fluoride. They receive enough of it in unavoidable and immeasurable quantities in their food, drinks, toothpaste and other sources, and frankly the risks are not worth the questionable benefits. If the water becomes fluoridated I will be forced to use a water filtration system. So many Orillians feel the same way, but might not be able to afford the luxury of a filtration system. This is simply not right.

Many cities in Canada that have fluoridated their water for decades are choosing to stop the forced medication of it"s citizens. It is difficult to understand the reasons Orillia's Councillors might use to justify a decision to impose this unneeded medication while being unable to control the dosage. If this were a doctor deciding this course of action, it would be enough reason for legal action.

Please consider my comments and vote No to fluoridation!

Sean Thompson
Orillia,ON

Appendix A3

-----Original Message-----
Sent: Wednesday, May 30, 2012 11:16 AM
To: JASON COVEY
Subject: water fluoridation

I wish to add my name to the list of residents opposed to fluoridation of our municipal water.
Bob Eaton

From: Gerry Cooper
Sent: Wednesday, May 30, 2012 2:18 PM
To: JASON COVEY
Subject: Question P@ May 29 Public Meeting on Fluoridation

Hi Jason:

Here is a copy of the question I raised at last night's meeting:

Context: I see no sign of a response to my February 29 public forum submission that assessed the January 2009 SMDHU Oral Health report. My analysis showed that there was essentially no correlation between tooth decay and the level of fluoridation in the 30 DHUs across Ontario. In fact, 4 of the unfluoridated DHUs, namely: 25,28, 29, and 30 had lower DMFT scores than SMDHU while fluoridated DHUs 19 and 23 had higher DMFTs. Furthermore, the DHUs with the highest fluoridation coverage did not have the lowest DMFTs. I also provided research findings of Dr. Bill Osmunson (DDS, MPH) in the US using federal oral health survey data and by the WHO showing that tooth decay is not a function of communities being fluoridated or unfluoridated.

Questions:
1. Why does the SMDHU persist in advising Orillia to fluoridate in light of such contrary evidence from its own 2009 report plus those presented in the other two references?
2. Will Orillia Public Works revise its draft report and recommendation to be more objective, balanced and consistent with the evidence set out in my Februart 29 submission?
3. Will Orillia staff consult with the unfluoridated DHUs 25, 28,29, and 30 to understand more fully the key factors for their superior dental health outcomes and advise Orillia Council in its revised report of the applicability of these non-fluoridation options for Orillia?

I have just received a copy of a similar DHU analysis for Grey-Bruce. A somewhat comparable pattern is apparent with 4 unfluoridated DHUs having lower DFMTs than the Simcoe-Muskoka DHU yet 6 fluoridated DHUs (including Grey-Bruce) having higher DMFT scores than Simcoe-Muskoka. The lack of strong correlation between tooth decay levels and fluoridation status is even more evident. Moreover, we are talking about typical DMFT differences of less than 1 tooth either way. It appears therefore that the SMDHU is basically making a mountain out of a molehill.

Orillia can risk manage the tooth decay molehill by relying more activley on other and proven preventive measures including better education of children and parents on proper diet, vitamin D3 supplements, twice daily toothbrushing and flossing backed by better use of CINOT and Healthy Smiles programs for those without dental care insurance. Whereas fluoridation costs Orillia 100%, CINOT, Healthy Smiles, and public dental health counselling only cost Orillia 25 cents on the dollar.

This is the 21st century intelligent solution ("isolution") option that the staff report should bring forward in its objective and balanced report to Council as a basis for an informed discussion vis-a-vis mindlessly embracing the outdated and discredited 20th century solution of mandatory, one-size-fits-all medication by fluoridation.

The essence of sound public policy is presenting and assessing alternatives for achieving the stated policy objectives.

Regards,

Gerry Cooper
Public Policy Advisor
People for Safe Drinking Water

-----Original Message-----
Sent: Wednesday, May 30, 2012 2:35 PM
To: JASON COVEY
Subject: Water Fluoridation

Jason,
I'm sure you know all about fluoridation so I won't lecture you but the uncontrollable dosage and unconsensual administration of silicofluorides in drinking water is deemed unethical and even immoral by many countries across the world. Diluting industrial-level hazardous waste products into the public drinking water is a 60 year old practice that is outdated and has been proven to have no significant effect on tooth decay. Fluoridating water can effect everyone differently due to inconsistent dosage, so how can you safely administer fluoride to tens of thousands of people who all drink different amounts of water and ingest different amounts of fluoride? Babies fed with water-based formula will ingest over 300 times the amount of fluoride as breastfed babies.

Fluoride works topically to help remineralize teeth in the early stages of cavity growth, however most of the fluoride is ingested and a very low amount is left in saliva to topically interact and benefit your teeth.

Sure, fluoride may be naturally occuring in ground water. But that is calcium fluoride, not silicofluorides, which otherwise must be disposed of in an extensive process that can cost $1-2 per gallon. Why should a compound that is disposed of so extensively be administered in our drinking water (besides the fact that it's a cheaper disposal method)? Silicofluorides have been tested positively to contain traces of radioactive uranium isotopes, which can have devestating effects on the body as they decay and emit radiation into body tissue.

Until there is definite proof that fluoridation is risk free (and actually has some benefits!), I strongly oppose fluoridation and think Orillia should not sink to the point of fluoridation. The risks definitely outweight the benefits at this time, and there is a multitude of evidence to support that.

From: Lynn Jamieson
Sent: Thursday, May 31, 2012 7:58 AM
To: MAYOR EMAIL
Subject: fluoridation should be a no brainer - don't mess with chemicals

PLEASE PLEASE PLEASE DO NOT ADVOCATE fluoridation of our precious water....there's enough going on in our lakes and rivers.....better still.....educate the parents and teachers on the fine art of showing the children how to brush and look after their teeth.....
I refuse to buy bottled water especially after all the money that was put into our new filtration system.....please please do not go ahead with it....
I thank you for your time.
a concerned tax payer and Orillia citizen, Lynn Jamieson

If you think you're too small to have an impact,try going to bed with a mosquito in the room-A,Roddick

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-----Original Message-----
Sent: Friday, June 01, 2012 1:29 PM
To: JASON COVEY
Subject: Fluoride consultation
Great report! Congratulations on your courage to push against the anti-science lobbyists.

Interesting history section.

On fluorosis: dentists will point out that most fluorosis cases are related to young children swallowing fluoridated toothpaste during unsupervised brushing. Water fluoridation raises the risk of this happening, but if you don't swallow toothpaste, you won't get fluorosis.

Skeletal fluorosis: see a recent article by authors in Toronto and Montreal (including Hardy Limeback) which reports on the examination of a number of skeletal samples and finds NO EVIDENCE that water fluoridation impacts bone health.

-----Original Message-----
Sent: Friday, June 01, 2012 1:39 PM
To: JASON COVEY
Subject: Water Fluoridation.

I think all the money being spent on promoting, and the cost associated with fluoridation, would be better spent on distributing fluoridated toothpaste to schools and families in low income areas. I myself am totally against polluting our water with more chemicals based on the biased reports of a few so called experts.

Sent: Sunday, June 03, 2012 1:27 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com; JASON COVEY
Subject: Written Submission re: Artificial Water Fluoridation

To Mayor Orsi and Orillia Councillors,

As a Registered Orthomolecular Health Practitioner, poor nutrition and lack of nutrients, especially Vit. D3, are the underlying causes of dental caries, and other illnesses. This should be your main cause for concern. http://orthomolecular.org/resources/omns/v05n03.shtml

Why would we INGEST more fluoride when MAJOR dental researchers concede that **fluoride's benefits are TOPICAL** NOT SYSTEMIC ??? (Fejerskov 1081; Carlos 1983; CDC 1999, 2001; Limeback 1999; Locker 1999; Featherstone 2000)

The **worst tooth decay** occurs in the poor neighborhoods of our largest cities, which have been **fluoridated for decades. Such as:**

Connecticut - Statewide mandatory fluoridation since 1960s:

> "Dental decay remains the most common chronic disease among Connecticut's children. Poor oral health causes Connecticut children to lose hundreds of thousands of school days each year. One in four Connecticut children is on Medicaid, but two of three Connecticut children receive no dental care. And DSS continues to exploit the seriously stretched public health providers and the few remaining private providers. There is an oral health crisis in Connecticut."
> SOURCE: Slate R. (2005). State must fund plan to provide oral health care for the poor. *New Haven Register* May 5

Children in NON-fluoridated communities, such as Orillia, are already getting the so-called "optimal" doses from other sources (Heller et al, 1997). In fact, many are being OVER-EXPOSED to fluoride. We are living in a 'FLUORIDE GLUT' society.

Dental fluorosis has INCREASED along with exposure to fluorides from OTHER sources. "**Current studies support the view that dental fluorosis has increased in both fluoridated and non-fluoridated communities. North American studies suggest rates of 20 to 75% in the former and 12 to 45% in the latter.**" - Locker, D. (1999). *Benefits and Risks of Water Fluoridation. An Update of the 1996 Federal-Provincial Sub-committee Report*. Prepared for Ontario Ministry of Health and Long Term Care.

AND, the low income families are more likely to suffer poor nutrition which is known to make children more vulnerable to fluoride's toxic effects. (Massler & Schour 1952; Marier & Rose 1977; ATSDR 1993; Teotia et al, 1998)

With so much overwhelming new information, more communities are rejecting new fluoridation proposals at the local level. On the national level, there have been hopeful developments such as the EPA Headquarters Union speaking out against fluoridation (http://fluoridation.com/epa2.htm) seeking to have the issue re-examined.

Water Fluoridation represents an entrenched "belief system" backed up by bureaucratic POWER and INFLUENCE, which started when Asbestos lined our pipes, lead was added to gasoline, PCBs filed our transformers, DDT was so "safe and effective" it was sprayed on kids in school classrooms.

The growing list of over 4,000 health professionals, Doctors, Dentists, Scientists, Environmentalists, etc., who have signed the Professional Statement to put an end to water fluoridation, is an indication of just how serious a concern overdosing with fluoride is, especially since there is such a narrow margin of safety, and especially since we are already fluoride saturated from so many other sources.

Much has changed in the last 60 years since water fluoridation was conceived. Fluoride is in fertilizers, pesticides, food fumigants, reconstituted beverages, dental products, food, especially baby food, teflon pans (which enters cooked food), etc. etc. An example:
"**The amount of infant foods containing chicken consumed should be considered when assessing the total fluoride intake, as it could contribute a substantial amount of fluoride. Children who regularly consume quantities of infant foods containing chicken should also be monitored to make sure that they do not ingest too much fluoride from other sources such as fluoride dentrifice, dietary fluoride supplements or fluoridated water.**" - Heilman JR, et al. (1997). Fluoride concentrations of infant foods. *Journal of the American Dental Association* 128(7):857-63.

Fluoride is a persistent bioaccumulator, and is entering into human food-and-beverage chains in increasing amounts." - Marier J, Rose D. (1977). *Environmental Fluoride*. National Research Council of Canada. Associate Committe on Scientific Criteria for Environmental Quality. NRCC No. 16081.

"**Based on this review, we conclude that fluoride intakes of infants and children have shown a rather steady increase since 1930, are likely to continue to increase, and will be associated with further increase in the prevalence of enamel fluorosis unless intervention measures are instituted.**" - Fomon SJ, Ekstrand J, Ziegler EE. (2000). Fluoride intake and prevalence of dental fluorosis: trends in fluoride intake with special attention to infants. *Journal of Public Health Dentistry* 60(3):131-9.

Consider the fluoride TREND, and the future, and decide what is **really** best for the health of your constituents and also for the environment, when you make your decision. Thank you.

Sincerely,

Ruth Bednar
R.H.N., R.N.C.P., R.O.H.P.
Gravenhurst, On

-----Original Message-----
Sent: Sunday, June 03, 2012 2:45 PM
To: JASON COVEY
Subject: fluoridation of our community water

Hello,
I am in support of fluoridation.
Your draft report is excellent.
Walter Ewing

From: Brian Campeau
Sent: Monday, June 04, 2012 1:46 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com;
Subject: Please do not Fluoridate my drinking water

Hello Mayor and councillors

I am asking you, as a long time citizen of Orillia to please vote against fluoridating my drinking water.

Thank you in advance for voting NO.

Brian Campeau
Orillia, On

From: Gerry Cooper
Sent: Monday, June 04, 2012 10:57 AM
To: JASON COVEY
Subject: Fluoridation, Lead Leaching, and Adverse Health Effects

Hello Jason:

Further to the May 29 public meeting on the draft fluoridation report, please see the attached submission which documents the scientific evidence of the interaction of HFSA and Pb in drinking water and implications for associated adverse health effects, especially with respect to the brain and teeth.

If you have any questions or comments, please contact me at your earliest convenience.

Meanwhile, I will undertake a thorough review of the Orillia staff's draft report and provide a further submission by June 15.

Regards,

Gerry Cooper

Attachment: Orillia Fluoridation Report May 2012

Orillia Public Consultation on Fluoridation Report May 2012

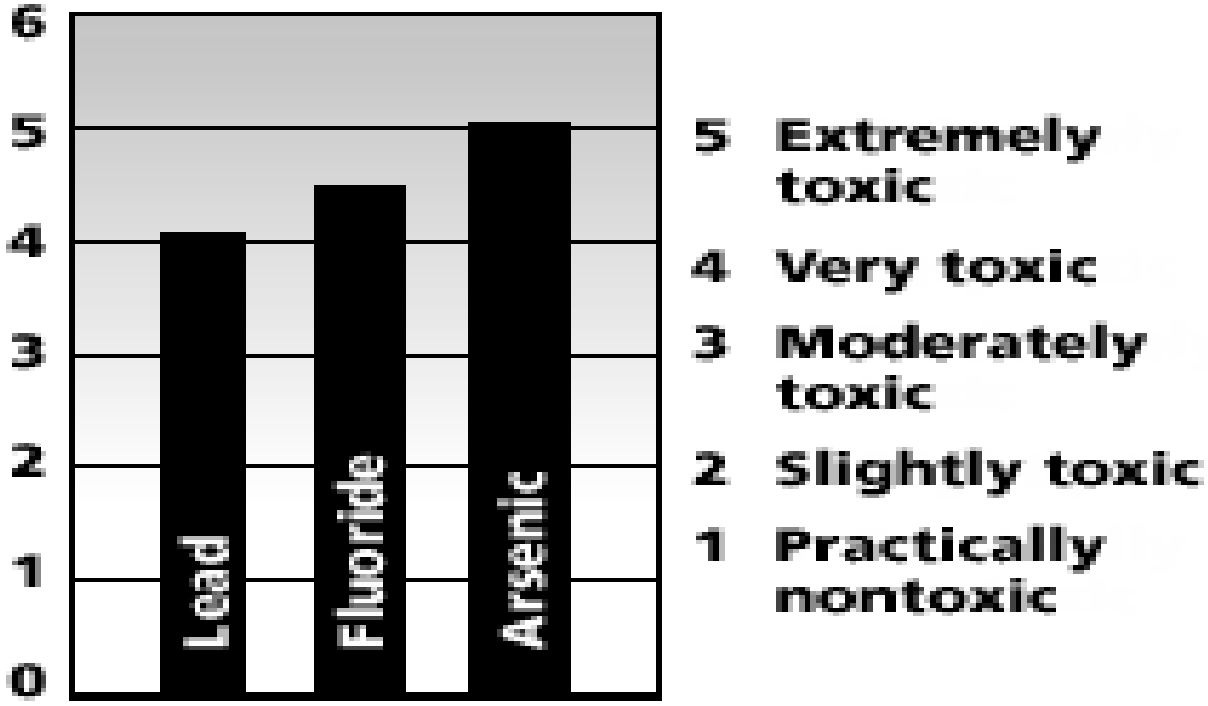
Fluoridation, Lead and Health: Connecting the Dots

Gerry Cooper, P Eng, B Eng, MBA
Public Policy Advisor
People for Safe Drinking Water
June 4, 2012

Introduction

- It was noted that the draft Orillia Fluoridation Report, May 2012 excludes the issue of lead (Pb) leaching which would occur if Orillia were to start fluoridating its drinking water.
- Orillia's Director of Public Works agreed at the May 29 public meeting to review a submission on this issue before finalizing the report to Orillia Council.
- This submission sets out the scientific evidence that shows the proposed HFSA fluoridating agent, if used, is the principle cause of Pb leaching which creates adverse health effects.
- Avoiding fluoridation reduces the extent of lead leaching and related adverse brain health effects.

Comparative Toxicity



Source: Fluoride Action Network Web Site

F is more toxic than Pb yet Government policy permits a maximum fluoride level (1,500 ppb) 150 times higher than lead (10 ppb) and arsenic (0 ppb).

Fluoridation Leaches Lead

(1) Maas, R.P., Coplan, M. et al (2007) report Effects of Fluoridation and Disinfection Agent Combinations on Lead Leaching from Leaded-brass Parts in *NeuroToxicology* 28:

- Tested pipes, couplings, meters, brass fittings in deionized or soft drinking water (note: not distilled water)
- With chloramine only, Pb level leached was 23.3 ppb.
- With chloramine and fluoride @ 2ppm, Pb level was 83.1 ppb
- Fluoride accounted for ~72% of total Pb leached.

(2) Vukmanich, J. Chief Chemist, Fluoridation Impacts on Water Chemistry P3-4, Report No. 2009.123 July 2009, Thunder Bay Water Department:

- Used soft drinking water from the treatment plant
- "all three fluoridating agents, at a concentration of 0.7ppm, increased lead leaching from the lead pipe."
- Worst case was unbuffered HFSA @ 0.7 ppm which leached 1630 ppb of lead after 360 hours or 2.6 times the control sample.
- City Council rejected regional public health staff recommendation to add fluoride plus NaOH buffer to the municipal water supply.

Research on Fluorides & Blood Lead

R. Masters, M. Coplan, "Association of Silicofluoride Treated Water with Elevated Blood Lead," *Neurotoxicology* 2000:

- Where silicofluorides (SiF) including HFSA are used in drinking water, children absorb more lead from the environment;

- In three separate epidemiological studies of over 400,000 children, SiF drinking water is always significantly associated with increased blood lead levels. Water treated with SiF appears to increase the cellular uptake of lead;

- Children are especially at risk for higher blood lead in those communities using fluoridated drinking water with end-of-pipe lead amounts in excess of 15 ppb in first draw water samples. The prevalence of children with elevated blood lead levels is about twice as high as that in unfluoridated communities;

- Ending the use of SiF in drinking water could contribute to lower rates of learning disabilities, ADHD, substance abuse, violent crime, and asthma, all of which are connected with lead poisoning and other toxins.

Note:10 ppb is the current Maximum Contaminant Level (MCL) for lead in Ontario drinking water, above which there are known adverse health effects from lead poisoning.

Fluoride and Blood Lead Cont'd

R.M. Sawan, et al, "Fluoride Increases Lead Concentrations in Whole Blood and in Calcified Tissues From Lead-Exposed Rats", in *Toxicology* 271, 2010

- Animal studies confirmed epidemiological findings of Masters, Coplan, et al 2000 were feasible.

- Found blood lead levels were 3 times higher in rats given fluoride and lead compared to those given only lead.

- Co-exposed rats had lead concentrations 2 to 3 fold higher in teeth (enamel, dentine) and bone (surface, whole).

Fluoride, Lead and Dental Fluorosis

Leite GA, et al 2011, “Exposure to Lead Exacerbates Dental Fluorosis”, in *Elsevier Journal*:

- Study was a blind, controlled, random clinical trial using Wistar rodents.

- Researchers found that the F and Pb group had more severe fluorosis defects than the control group with both elements interacting to disrupt the mineralization of tooth enamel during its formation.

- Also found that higher lead levels in blood and bone occurred in the F and Pb group than the other 3 groups thereby showing F increases the uptake of Pb in body tissues.

- Concluded that Pb exacerbates dental fluorosis and may affect the degree of fluorosis but noted that this cannot be directly transposed to humans.

Fluoride's Triple Pb Whammy

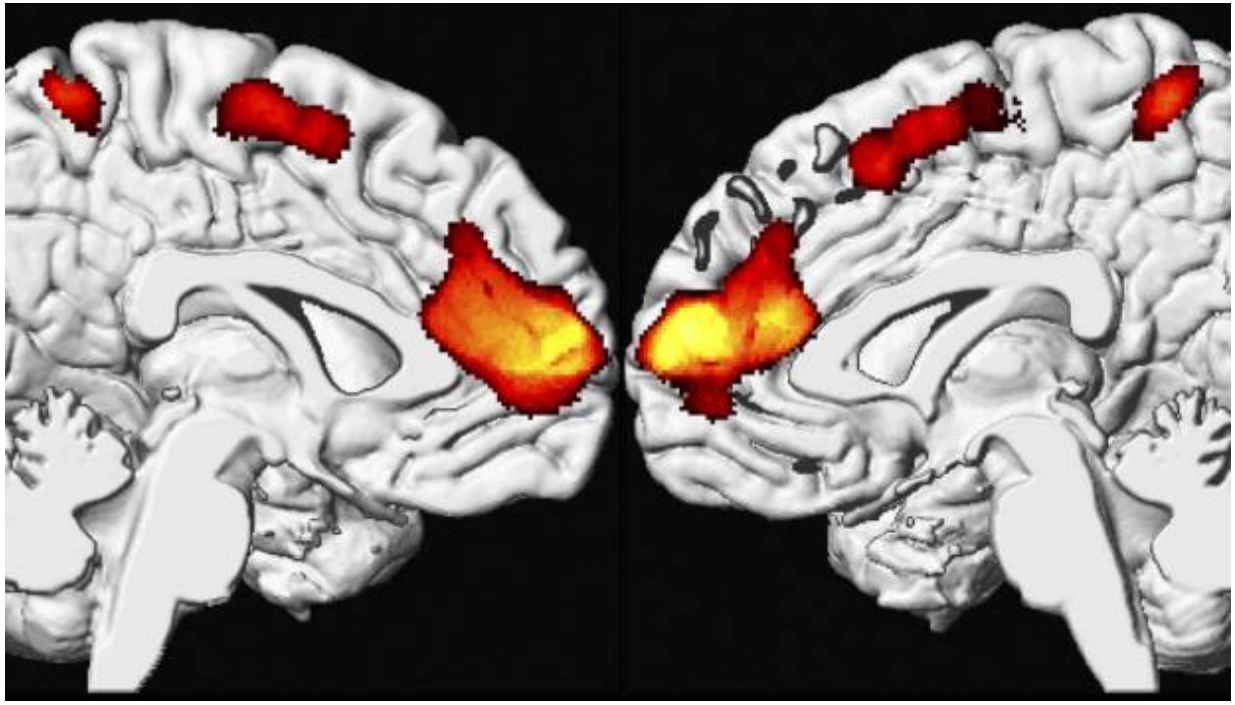
Fluoridated Drinking Water (FDW) using HydroFluoroSilicic Acid (HFSA), chlorine and ammonia raises lead (Pb) levels in 3 ways:

- HFSA itself contains co-contaminants Pb and As, each at about 0.6 ppb.

- HFSA and its dissociated HF gas cause Pb to leach from distribution pipes and fittings into drinking water. HFSA and HF gas are highly corrosive.

- HFSA plus chloramine increases corrosion of lead from pipes and fittings to well over the 10 ppb MAC for health safety.

Lead Impairment of the Brain



- Pb, a heavy metal, is a known neurotoxin for over 100 years.
- Brain damage (swelling, reduced volume, missing connections,) is subtle, significant, permanent with onset in prenatal & early life. Frontal lobes especially vulnerable in young men.

Lead Impairment of the Brain Cont'd

- Adverse Health Outcomes:
  - reduced intelligence, learning disabilities
  - attention deficit hyperactivity disorder,
  - antisocial and behavioural problems,
  - criminal acts.
- No Safe Blood Lead Level:
  - There is no science-based safe level for lead exposure. Per Dr. Lanphear: "There's no evidence of a threshold. At the lowest levels of exposure, we see the greatest IQ (decreases)." This casts serious doubt on the current Ontario threshold of 10 ppb MAC.
  - Per Gilbert & Weiss, 2006 adverse health effects have been shown with Pb levels of 3 ppb in drinking water.
  - Canfield *et al,* 2003 study in New England Journal of Medicine estimated an average IQ decline of 7.4 points in 101 children when blood lead levels rose from 1 ppb to the 10 ppb limit.

Conclusions

- Given the foregoing, the medical precautionary principle (first do no harm) should be invoked.
- The F-Pb adverse health links dictate, for the ongoing safety and well-being of its children, that the fluoridation of Orillia's drinking water must be avoided.
- The costing in Department of Public Works May 2012 report omits the use of a buffering agent which is more expensive than the cost of HFSA.

Sources: references to Dr. Bruce Lanphear, SFU, B.C. from articles by Anne McIlroy, Science Reporter, Globe and Mail, Sep. 30, 2010 and Catherine Porter, The Toronto Star January 27, 2011.

-----Original Message-----
Sent: Monday, June 04, 2012 2:59 PM
To: JASON COVEY
Subject: Business Case for Fluoridation

This is turning out to be quite an emotional issue. However, I would like to present a more open minded observation. One that seems to be not looked at. The safety of Fuoridation in water supplies (at the relatively low concentration level) is pretty well understood.

The issue is who actually drinks the Orillia water? The Fluoride is only effective if it actually gets into the person's system. Things have changed since the early studies, namely the introduction bottled water, the extensive use of RO houshold (and commercial) water filtration systems. Orillia has had chronic taste problems with their water supply which tends to discourage using it for drinking.

The numbers representing the effectiveness of fluoridation are true, however, the assumption that most people drink tap water in Orillia is questionable.

Has survey been done, (or at least an educated quess)to find out what percentage of people (more importantly young people) actually drink tap water.

If this number is not at high, then adding fluoride would not have the desired effect on the population.

If people are not drinking tap water, then there absolutely not point to adding fluorine.

My 2 cents

Bill Dunlop P. Eng.

PS How's the UV system's working??

From: Marshall Martin
Sent: Tuesday, June 05, 2012 9:52 AM
To: MAYOR EMAIL
Subject: Fluoridation

Good morning Angelo: This may come too late, but wanted you to know that I am against fluoridating the water. I believe that it is very bad for the environment, as well as for our bodies. There is already plenty of fluoride in the dental products we all use, and I am very surprised that the dentists want it, as they are already pinched for customers with the economy. Orillians do not need to pay more 'expenses' in our taxes to run the water plant. It will remain to be seen if public opinion means anything in this debate. -- Marshall Martin

---

From: Gerry Cooper
Sent: Tuesday, June 05, 2012 11:36 AM
To: JASON COVEY
Cc: Susan Schweitzer
Subject: Appendices to Draft Report on Fluoridation

Hello Jason:

When will the 14 appendices to the draft report be posted on the city web site?

These contain information that is central to the issue and heence should be readily available to the public. Their omission is a serious contravention of the four stated objectives of the public consultation process.

Some 10 days have elapsed since the body of the draft report was posted. The deadline for submissions should, in fairness, be extended beyond June 15 by the same interval by which posting the appendices are delayed.

Regards,

Gerry Cooper

From: Gerry Cooper
Sent: Wednesday, June 06, 2012 11:49 AM
To: JASON COVEY
Cc: Susan Schweitzer
Subject: Re: Appendices to Draft Report on Fluoridation

Hi Jason:

Thanks for the update on availability of the appendices. I note that neither Appendix A nor Appendix M have been completed and posted to the city web site.

I also note that there has been no public notice on the web site that residents could see the appendices at City Hall. Seeing is not the same as having a copy in-hand for detailed review. Neither do the appendices posted contain the two submissions I made in February and March.

So this part of the process remains opaque rather than transparent.

I therefore ask again that you confer with Peter Dance to extend the June 15 deadline to take into account the delays in posting the missing appendices. Id you are unwilling or unable to do so, please let us know so that we can escalate this issue to members of Council.
Regards,

Gerry Cooper

-----Original Message-----
Sent: Wednesday, June 06, 2012 2:03 PM
To: JASON COVEY
Subject: Fluoridation

It's now 2012 and over 60% of communities in Canada realize that fluoridation of water has no positive effects on human health due to the high level of sanitation we enjoy. Ingesting fluoride has never been shown to have any benefits, only topical usage has had benefits. We have fluoride in soda pop, bottled water, tea, toothpaste, mouthwash, why do we need to put it in the water supply? The simple answer is, we do not. We also don't need the cost of this age-old, toxic procedure.

I would like you to take a few moments as you decide what to do in Orillia to look through some of the scientific, peer-reviewed evidence you may not have seen yet.

1) 97% of Western Europe has chosen fluoride-free water. Here are statements from the vast majority of other developed countries that reject water fluoridation - http://www.actionpa.org/fluoride/countries.pdf
2) Every other chemical is added to water to improve the water's quality and safety. Fluoride does not do this, it is the only chemical added for the purpose of medication.

3) Fluoridated water is no longer recommended for babies. Babies who have the misfortune of being fed formula will have little choice at avoiding fluoride if you're poisoning Orillia water with it. The American Dental Association made this recommendation in November 2006 - http://www.fluoridealert.org/ada.egram.pdf
4) Toothpastes that contain fluoride warn not to use any on infants as they may swallow it, yet you want to put it in the water? Will you warn the community that infants should not drink the drinking water?
5) Ingestion of fluoride has little benefit, but has been shown to have risks to the brain, thyroid gland, bones and kidneys.
6) Cavities did not rise in communities that stopped fluoridating.

Here are 50 reasons to oppose fluoridating your water supply:

http://www.fluoridealert.org/50-reasons.htm

Sincerely,
~Richids Coulter

From: Richids Coulter
Sent: Wednesday, June 06, 2012 1:58 PM
To: MAYOR EMAIL
Cc: Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com
Subject: Orillia fluoridation

It's now 2012 and over 60% of communities in Canada realize that fluoridation of water has no positive effects on human health due to the high level of sanitation we enjoy. Ingesting fluoride has never been shown to have any benefits, only topical usage has had benefits. We have fluoride in soda pop, bottled water, tea, toothpaste, mouthwash, why do we need to put it in the water supply? The simple answer is, we do not. We also don't need the cost of this age-old, toxic procedure.

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4) Toothpastes that contain fluoride warn not to use any on infants as they may swallow it, yet you want to put it in the water? Will you warn the community that infants should not drink the drinking water?
5) Ingestion of fluoride has little benefit, but has been shown to have risks to the brain, thyroid gland, bones and kidneys.
6) Cavities did not rise in communities that stopped fluoridating.

Here are 50 reasons to oppose fluoridating your water supply:

http://www.fluoridealert.org/50-reasons.htm

All 50 reasons are fully referenced. Hopefully this will help you in the face of the industry propaganda found on the Orillia.ca website.

Sincerely, Richids Coulter

Dear Mayor Orsi and Orillia City Councilors June 6 2012

I have been following the media coverage of the debate over whether or not Fluoride should be added to Orillia's drinking water. Although I have not been able to attend any of the meetings at City Hall, I want to assure you that I am against adding fluoride to our water and have signed a petition stating so.

I attended the lecture by Dr. Paul Connett at Lakehead University and learned a large amount of information regarding the dangers of fluoride; I already knew some information and his lecture certainly clarified questions that I had regarding fluoride. I have spoken with many dentists and hygienists, in Orillia, Barrie, Beaverton and Toronto and it appears to me that the ones that have chosen to do extensive research find that fluoride most often does more harm than good.

I would like to share with you the dental issues that my son has had. Two years ago at her first dental check-up (at the age of three), my son had 10 cavities. I can assure you that he has a very healthy diet, consisting of organic foods and very little sugar. I was given advice from Dr. Brian Maclean (dentist) to give him vitamin K and vitamin D daily. I added these two vitamins to the fish oil and multivitamin that he was already taking daily.
He had the cavities filled, and continued taking the vitamins. After 9 months I took him for a check up and he had no new cavities, he recently had another check up after another nine months and again has no new cavities.

One would assume that a child that had that many cavities would continue to get more and more. Besides giving him the extra vitamins, nothing else changed with his nutrition or brushing habits.

My son is very sensitive and it worries me greatly to think of how fluoride in his water may negatively affect him.

I urge you to **vote NO** to adding fluoride to Orillia's water. When all of the facts and statistics are looked at and analyzed, the wiser choice is to promote dental hygiene and nutrition education (including the use of vitamins).

If every parent were given the advice that I was given about which vitamins help build strong teeth and help prevent tooth decay, I believe that we would see a vast improvement in the dental health of Orillia's children.

Thank You Colleen Genno

Colleen Genno
Orillia Resident

FOR YOUR INFO
DATE June 11/12
TO Jason Covey

JN, Clerk's Dept

From: **Simcoe Region Chapter** <simcoeregionchapter@live.ca>
Date: Wed, Jun 6, 2012 at 3:37 PM
Subject: Agenda for Meeting on Wednesday, June 13th, 2012 at 7:00 p.m. Simcoe Region Chapter Council of Canadians
To:

Hi Everyone

Council of Canadians - Simcoe Region Chapter
Meeting Wednesday, June 13th, 2012 - 7:00 p.m. at the Barrie Public Library

We are not meeting for July and August - but we will meet on the second Wednesday on September 12, 2012 7 pm at the Barrie Public Library.

Agenda - please let us know if you want to add to the agenda.

- **Ecofest participation** June 9 from 10:00 a.m. to 10:00 p.m. and June 10 from 10:00 a.m. to 5:00 p.m. ... Please see http://ecofestbarrie.ca/
- We need **YOU** to help at the Simcoe Region Chapter table in the NGO tent Please call Marianne at 705*300 3252 if you can help either Saturday or Sunday....

- The Council of Canadians Simcoe Region Chapter organized a Panel discussion at 4 pm to 5 pm pm on Saturday June 9 th, 2012 in the Root of the Idea Exchange
  Tent: http://www.ecofestbarrie.ca/ Please see this short film as a preview to the Saturday's panel discussion. This year, Ecofest is offering two Root of the Idea Exchange panels (Sat and Sun). On Saturday at 4 pm the Council of Canadians - Simcoe Chapter will share their expertise on bottled water (Blue Communities and The Great Lakes Tour with Maude Barlow) and water quality in our community - along with Jeff Monague - former Native Chief, Annabel Slaight - Ladies of the Lake and SPLASH, and Jeff Lehman - Mayor of Barrie. Bring your questions and ideas about the bottled water issue and how we can ensure our community is using our drinking water sustainably. **http://youtu.be/c5ZtHyv91-8**

- **Please peruse the above attachment of a list of You Tube videos pertaining to our Canadians Banking System which underlies most of our economic, environmental and energy problems..... We hope to have a discussion about this at our meeting... as most people do not know about this important facet of our world.....**
- **http://londoncouncilofcanadians.ca/CoC2011BoCresolutionJune2011.pdf**

- We will discuss the recent developments of our efforts to make Barrie and Innisfil into Blue Communities. a) Recognizing water as a human right; b) Promoting publically financed, owned and operated water and wastewater services; and c) Banning the sale of bottle water in public facilities and at municipal events. **BOTTLED BEVERAGES AT SPECIAL EVENTS**

  City of Barrie Minutes of the meeting May 28th, 2012:
  That staff in the Culture and Environmental Services Departments prepare a report for General Committee's consideration outlining a strategy to reduce reliance on bottled beverages at special events hosted and/or approved by the City of Barrie, including but not limited to the following guiding principles and goals:

  a) A social awareness campaign to educate residents and consumers about the value and safety of municipal drinking water, the environmental implications of non-recycled Polyethylene Terephthalate (PET) bottles and the importance of source water and watershed protection; and

  b) Encouraging/Requiring increased access to municipal drinking water and refilling stations wherever practical, while continuing to sell bottled beverages at special events hosted and/or approved by the City of Barrie. (Item for Discussion 6.1, May 28, 2012) (File: E00)

  This matter was recommended (Section "I") to City Council for consideration of adoption at its meeting to be held on 4/6/2012.

  It was passed on that date as suggested above. I just checked with the Clerk's office on June 6, 2012 City of Barrie (705) 726-4242 begin_of_the_skype_highlighting (705) 726-4242 end_of_the_skype_highlighting begin_of_the_skype_highlighting (705) 726-4242 end_of_the_skype_highlighting**705* 726-4242**

- Don MacNeil will give us the details as he attended Barrie Council.

- **Support for Orillia group fighting fluoridation of their water.** The Council of Canadians is not supportive of fluoride in drinking water as is clear on the website http://canadians.org/water/issues/fluoride/index.html There was a public meeting on May 29th. Reporting back of findings and recommendations. Receipt of questions and comments from the public. This was a complete farce - it did not answer questions and submissions - it was just an hour and a half of reading the report and then very inadequate answers from Health Canada and the Muskoka Simcoe Health Unit dancing around the issues. Please voice your concern by June 15th, 2012 which is the **Deadline for Public Input on Draft Report** Please submit your comments and questions in writing to Jason R. Covey, P. Eng. by this date. http://www.orillia.ca/en/livinginorillia/Fluoridation.asp
- Please see http://cof-cof.ca/2012/02/fluoride-battle-brews-in-orillia-ontario/ - and please VOTE on this link.

- Please also see:
  https://www.facebook.com/GmoAndFluorideFreeOntario for further information and please LIKE the page....

- A group has formed in Barrie around the issues of labeling GMO's - genetically modified organisms - We meet on the first Wednesday of the month - please phone Marianne Else for details and follow the above facebook page - and please share - this is an issue that is not known to most people and GMO's are in 80% of our foods -

hidden even in the carragenan of our icecream - as it is grown on GMO soy bean material.

- **AWARE Simcoe-Barrie Public Meeting was a great success according to Mike Fox on May 26 at the Grace United Church The TOPIC was the "Shocking" Cost of Energy ... Financial ... Social ... Environmental - panel of expert speakers - questions, comments from the audience The speakers were great and I am only sorry that I was not able to attend and film the event... Many thanks to Mariane Cacilla for organizing this and we hope to get a report from her at this meeting.**

- **Great Lakes Need Great Friends Protecting The Great Lakes Forever - the 8 city tour ended May 30, 2012 - Maude Barlow, Vicky Monague and others spoke on May 28 -in Perkinsfield, Township of Tiny** Tiny Community Centre.: I filmed the event and also the conference in Toronto - please see and share these videos on our You Tube channel : http://www.youtube.com/user/simcoeregionchapter Please peruse and let us know your story and experience with the Great Lakes and Lake Simcoe...

- **CHAIN - NGO's** non governmental organizations have been meeting at a nwe location: Nifty Thrifty at the corner of Toronto Street and Dunlop Street - the entrance is at the parking lot behind Dunlop Street on the last Thursday of the month ... Please contact Karen Fox for further information.705 721 6867.

- **City of Barrie was Awarded Two Waterworks Awards:**
- **http://www.barrie.ca/City%20Hall/MediaRoom/Pages/Detail.aspx?MediaRelease=196**

We hope to see you at Ecofest and at this meeting on June 13th, 2012 - Our world and water are in peril - maybe you can help ????

Many blessings from Marianne Else and greetings from Mariane Cancilla

http://www.facebook.com/pages/Council-of-Canadians-Simcoe-Region-Chapter/199212250127335?sk=wall

simcoeregionchapter@live.ca 705 *300 3252

http://www.youtube.com/user/simcoeregionchapter

http://www.facebook.com/group.php?gid=183316441007

From: Lisa Vaillancourt [mailto:lisav1234@rogers.com]
Sent: Thursday, June 07, 2012 11:37 AM
To: MAYOR EMAIL
Subject: Fluoride.....

Dear Mr. Orsi,

I have done a lot of reading on the subject and feel there is too much to be worried about, concerning adding Fluoride to our drinking water. This detailed link below shares the documented dangers of adding such a chemical to our drinking water.

http://www.fluoridealert.org/50-reasons.htm

In the link above;
From numbers #20-34 and the Conclusion....so much of what is said refers to babies, health dangers (kidneys, arthritis, our brain function etc) These are very serious indications of what we "Should NOT be adding to our already pure drinking water"

We are lucky to live in an area, on earth, where we can benefit freely from drinking our clean tap water daily!

Concerning cavities and children...it is important for parents and childcare providers of these young children to insure healthy cleaning and brushing habits, twice daily.

This includes flossing, drinking lots of water and healthy juices (not full of sugar) AND maintaining a healthy diet full of fresh fruits and vegetables. I have a 22 yr. old adult (child) who has never had a cavity!!

I know parents are busy...but more intentional aid with dental hygiene and their children, is necessary!

I don't want infants to be consuming fluoride.

If couples are having trouble conceiving, do we add hormones to the drinking water to help reproduce??!

I believe it is important to make safe choices as a community.

Sincerely,
Lisa

From: Joyce Fisher
Sent: Thursday, June 07, 2012 9:08 PM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden
Subject: Fluoridation of Drinking Water in Orillia

Dear Mayor and Councillors of the City of Orillia;

We wish to register our objection to the fluroridation of Orillia's drinking water. This would be simply a bandaid approach to dealing with a health issue rather than addressing the causes. Better to spend the money on nutrition and dental hygiene education. In the sixties some communities offered a topical application of fluoride in the schools which would also be a feasible alternative and provide families with some choice in the matter.

We hope that you will vote against this process!

Wendell & Joyce Fisher

From: Kallie Miller
Sent: Friday, June 08, 2012 1:46 AM
To: Lynda.murray170@gmail.com; MAYOR EMAIL; Patrick Kehoe; Andrew Hill
Cc: thegardys@hotmail.com; Pete Bowen; Paul Spears; Tony Madden; JASON COVEY; Peter Dance
Subject: MOH says fluoridation is safe. I say "Show me the toxicology studies"

Kallie Miller, RN from London, Ontario has sent this to Orillia council members. Just insert, Orillia where Petrolia is written. As a registered nurse it took me some time before I began to question authority and the experts. I have found it a worthwhile exercise and it started me on the path of supporting the end of fluoridation with hydrofluorosilicic acid until we know it is safe for long term use. Please just ask to see the toxicology studies on long term use of HFSA that the experts say have been done. It is very simple, if they say they are done, prove it to us, show them to us. Hopefully you will do this and care for the well-being of your citizens. It takes wise decision making and courage to buck authority when it is necessary. I wish you good fortune, wisdom and courage.
Letter to the Petrolia Topic in response to the MOH saying fluoride is safe and effective.

http://www.petroliatopic.com/2012/06/05/support-reaffirmedfor-fluoridation

Just ask Dr. Greensmith to refer you to the toxicology studies showing HFSA is safe for long term use. If he says you don't need toxicology studies because HFSA dissociates, and quotes the Michigan study, say the since it was done with distilled water, you would like to see the studies showing that HFSA is safe for long term use in Petrolia tap water. As you can imagine, every municipal source water has some chemical differences depending on the geography. I would hope that Petrolia councillors cared enough for the well-being of their citizens to at least see all the needed studies to prove HSFA is safe for them. It is time to question the "experts" or "authorities" and know for yourself. It can be done. Just insist it be done.

From: dianne orton
Sent: Friday, June 08, 2012 10:35 AM
To: MAYOR EMAIL; Andrew Hill; Linda Murray; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Wayne Gardy
Cc: Jason Covey; Peter Dance
Subject: Canada's Chief Dental Officer Embroiled in Conflict of Interest

Good Morning all:

In all sincerity, I thought I should bring these articles to your attention.

I cannot help but wonder, how often does Dr. Cooney "wear two hats"?

"Canada's Chief Dental Officer Embroiled in Conflict of Interest"

"As if there were any doubt about this egregious conflict of interest, upon rising to speak Cooney actually announced, "I am wearing two hats"!" ..... read the full story.

http://www.pacificfreepress.com/news/1/11258-canadas-chief-dental-officers-mercury-connections.html

http://articles.mercola.com/sites/articles/archive/2011/06/28/canada-blatantly-disregards-its-own-ethics-policy-and-harms-many.aspx

"The Canadian government's ***Values and Ethics Code for Public Service*** clearly states that officials must" "avoid or withdraw from activities or situations that would place the public servant in real, potential or apparent conflict of interest with his or her official duties." .....
"Canadians have a right to a Chief Dental Officer who is, as the petition stated," "not hopelessly entangled with an amalgam seller-trade group partnership that is working to protect risky -- albeit profitable -- mercury products."..... read the full story.

From: dianne orton
Sent: Saturday, June 09, 2012 12:33 PM
To: Peter Dance; Jason Covey
Cc: MAYOR EMAIL; Andrew Hill; Linda Murray; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Wayne Gardy
Subject: Fw: IAOMT pdf Policy position on ingested fluoride and fluoridation

http://www.iaomt.org/articles/files/files196/IAOMT%20Fluoridation%20Position.pdf
Mr. David Kennedy is a Past President of the International Academy of Oral Medicine and Toxicology. He earned a degree in Comparative Biochemistry and Physiology from the University of Kansas and a Doctorate of Dental Surgery from the University of Missouri.

IAOMT Position on Fluoridation

In IAOMT's ongoing examination of the toxicological data on fluoride, the Academy has made several preliminary determinations over the last 18 years, each concluding that fluoride added to the public water supply, or prescribed as controlled-dose supplements, delivers no discernible health benefit, and causes a higher incidence of adverse health effects.

From: john coles
Sent: Tuesday, June 12, 2012 9:48 AM
To: JASON COVEY
Subject: Fluoridation of Orillia Water

Please see the attached link that speaks strongly against the idea of adding fluoride to Orillia water.
Thank you.
John Coles
Orillia

http://articles.mercola.com/sites/articles/archive/2012/06/12/the-hard-to-swallow-truth-documentary.aspx

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From: Marilyn and Steve Goulter
Sent: Wednesday, June 12, 2012 10:28 AM
To: JASON COVEY; MAYOR EMAIL; Linda Murray; Andrew Hill; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Michael Fogarty; Wayne Gardy; Charles Gardner; Peter Dance; Percival Thomas
Subject: May 29 presentation - my thoughts!

See attached.
Steve Goulter

Attachment:

May 29/12 Orillia Public Works Water Fluoridation Presentation

I cannot begin to portray my disappointment with the May 29th presentation.

I just do not understand how anyone, let alone Professional Engineers, could think that the risks associated with fluoridation are worth the perceived benefits. Are Engineers not supposed to study all the facts with an open mind, check and double check all data, and then to draw unbiased conclusions based on what is the correct thing to do? Are Engineers not supposed to place safety above all else? Are Engineers not supposed to seek the truth and nothing but the truth? Did they not have to swear an oath to tell the truth and conduct themselves with the utmost of integrity in order to become an Engineer? And since when do Engineers sit on the stage and tell us about the HEALTH BENEFITS of water fluoridation – not just in casual passing – but for a whole hour of the 70 minute presentation?

The only explanation for this ridiculous situation is that Local Health Unit wrote the majority of the presentation and had Public Works Engineers read it. It was stated that the decision to fluoridate is made at the municipal level, but in this case it appears to be obvious that the Local Health Unit is running the show – Public Works has been told what to say down to the smallest detail. The age old technique of a "gun to the head" gets the desired result – even from Professional Engineers, which boggles my mind! If the Professional Engineering Ethics Committee were aware of their conduct, I am sure there would be dire consequences.

If this presentation had been given by Dr. Gardner, our local defender of our medical system, I could fully understand and would not be surprised at the "twisting" of solid scientific proof that water fluoridation is very clearly a really bad thing to do, as he is such a strong supporter of it and is determined to mandate it for everyone in Orillia. Dr. Gardner claims to have read Dr. Paul Connett's book "The Case Against Fluoride". I cannot imagine any person that would still defend fluoridation after reading this masterpiece – one of the most up-to-date, scientifically founded, peer reviewed works on this subject available today – let alone a medical doctor whose prime mandate is to "Do No Harm". But for Engineers in the Public Works Dept. to take this same stand is irrefutable proof that they are acting simply as "puppets" to Public Health! As an Engineer myself, I could not image how demeaning this must feel to those imbedded in such a deception.

The process being used in Orillia to bring a proposal before Council for water fluoridation is SERIOUSLY FLAWED and TOTALLY BIASED. It is blatantly obvious that all information sent to Public Works from the anti-fluoridation side has been ignored and not considered. Not one article was ever added to the City web site that informs the public of some of the risks – in spite of telling us that they would present a balanced view – another confirmation that what appears anywhere in public is censored and tainted by the so called "health" industry. Since when is it legal to totally mislead the public? Oh yes, I forgot – in Dr. Gardner's own words, "we know what is best for you"!

Our only hope now is that our elected officials (whose job it is to represent the people), ie, the Mayor and his Councilors will do the right thing and vote "NO" to water fluoridation in Orillia, upholding the wishes of 80% of constituents.

Steve Goulter, MSc , June 7/12

City of Orillia

ORILLIA CITY CENTRE
50 Andrew Street S.
Suite 300
Orillia, ON L3V 7T5

TELEPHONE
(705) 325-1311
FACSIMILE
(705) 325-5178

OFFICE OF THE CITY CLERK

Direct Line: (705) 325-2108
E-MAIL: jnyhof@orillia.ca

June 12, 2012

Ms. Colleen Genno
448 Jamieson Drive
Orillia, ON L3V 4Y5

Ms. Genno:

Re: Fluoridation in the City's water

This to acknowledge receipt of your letter received by the Mayor's Office on June 11, 2012 regarding fluoridation.

I have forwarded your letter to the Public Works Department for their information.

The Public Works Department will be presenting a report to Council Committee at its meeting held on July 16, 2012 for discussion.

Please refer to the City of Orillia's website at http://www.orillia.ca/en/livinginorillia/Fluoridation.asp for further updates on this matter.

Regards,

J. Nyhof

Janet A. Nyhof, CMO
Deputy Clerk

:dc

Copy to: Jason Covey, Water/Wastewater Engineer, Public Works Department

Wednesday, June 13, 2012

James D. Upper
Orillia

Jason Covey
Water and Wastewater Engineer
The City of Orillia
Orillia City Centre
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5

Regarding: Public Consultation on Fluoridation Report

Dear Sir,

While I feel like saying thank you for allowing me to address the fluoridation of my water supply I am also aware that I will be paying for this in my taxes and on my water bill. I would like to point out some facts prior to commencing any actions with regard to this unwanted chemical being added to my water purchase.

The current and historical composition of the water supplied by Orillia has been relatively the same for years. When learning about the push by Health Canada and the Simcoe Muskoka District Health Unit to medicate people and I add not by a notice included the normal water bill, I realised there is a lack of transparency involved in this co-ordinated project. If I owned property here and wasn't here I wouldn't have been informed of this change to the product the city produces.

City council requested the assistance of SMDHU Dr. Gardner to create the report being used by the council to adopt or reject it. This is totally biased, lacks credibility and any form of fidelity as far as the public engineers are concerned when you have an unbalanced input into constructing the report. Even the times allotted for oral submissions were not the same. This should have been addressed in the report and wasn't. It is just dead wrong and is collusion on all parties being paid by tax payers' money to implement discharging this toxic waste into our water supply.

Now it has been learned that a major source of information relied upon to form this report comes from Health Canada who has had its Chief Dental Officer Dr. Peter Cooney here in meetings assisting both Simcoe Muskoka District Health Unit and the city in promoting this water fluoridation project.

Dr Peter Cooney has not only mislead the public of Orillia and city council but has also been caught lying to Hamilton City Council stating that fluoride is not listed as a drug. I remember Dr. Cooney telling us that fluoride is actually a nutrient and is natural. How can it be if it is listed as new drug which is not deemed proven safe or effective by definition since 1999 in one of Health Canada's own lists?

Dr Peter Cooney was recorded saying so and it was posted on Youtube: http://www.youtube.com/watch?v=lvxMLgzKkLc&feature=endscreen&NR=1 by the Canadian Awareness Network who refers to the Health Canada Listing of Drugs Currently Regulated as "New Drugs": http://www.hc-sc.gc.ca/dhp-mps/prodpharma/applic-demande/guide-ld/newdrug-drognouv/ndrugs_ndrogue-eng.php of which Fluoride is listed.

I wish to advise that the definition of a "new drug" from Section 2 of the Food and Drugs Act is critical in that it defines fluoride within this classification. It has been listed since 1999. It states that a "**new drug**" means

a. a drug that contains or consists of a substance, whether as an active or inactive ingredient, carrier, coating, excipient, menstruum or other component, that has not been sold as a drug in Canada for sufficient time and in sufficient quantity to establish in Canada the safety and effectiveness of that substance for use as a drug;

b. a drug that is a combination or two or more drugs, with or without other ingredients, and that has not been sold in that combination or in the proportion in which those drugs are combined in that drug, for sufficient time and sufficient quantity to establish in Canada the safety and effectiveness of that combination and proportion for use as a drug; or

c. a drug, with respect to which the manufacturer prescribes, recommends, proposes or claims a use as a drug, or a condition of use as a drug, including dosage, route of administration, or duration of action and that has not been sold for that use or condition of use in Canada, for sufficient time and in sufficient quantity to establish in Canada the safety and effectiveness of that use or condition of use of that drug.

I contend there is fraudulent activity going on in this process of moving the City of Orillia to medicate the city water with toxic waste (HFSA) rather than the drug fluoride. The fact is Dr. Gardner, Dr. Cooney and Peter Dance have suggested that adding fluoride is safe. Despite what was said the fact remains that it is not fluoride that is being added to increase the fluoride level of which they say is fluoride which is a regulated drug. False claims being made about the effectiveness of the regulated drug called fluoride is illegal. There has never been a double blind study done that was used to support this venture into mass medicating the public. All of the science submitted to this issue by SMDHU has been anything but a real study on the health affects that will or have occurred using Orillia's water and HFSA. Currently these meetings have been recorded as evidence.

I also note that the city of Orillia will be using unmonitored metering pumps fed from a barrel for a safety backup in case the pumps malfunction or siphon into the water after which no water testing will take place? Who is going to monitor the metering pumps at the well 24/7? The report did not include any engineering information as to the types and manufacturers equipment or types of materials that will be used in performing this project.

I have worked at equipment maintenance of water treatment for aquatic Bottlenose Dolphins and Orca which we maintained chlorine gas injection systems, chlorine generators, ozone generators, aluminum oxide injection, sand filters and D.E. filters. I am concerned that the level of testing and monitoring of the final product delivered to Orillia households will not be even close to the protocol we had in place for marine animals. Despite the precautions taken there were accidents that occurred during times they were not monitored. What has been presented in the report that the chemical to be introduced to the water system will not be tested by the city but rather a certificate from the manufacturer will be relied on for its composition may avoid liability to the city does not protect the end users.

Furthermore, I understand there will be no testing of the water by the city after HFSA is added to the water as was stated by the city when questioned. This is not good enough to ensure the safety of the public. I would suggest that a more thorough look at this issue be taken. The scientific information excluded by SMDHU and your engineering staff requires a better review than by having Dr. Gardner do it for you. The comments offered by Dr.'s Gardener and Cooney who seem to have a different incentive to dump this toxic waste into our water than just tooth decay and having Professional Engineers not consult an outside opinion but rather mirror one side of this issue is not being responsible.. Children who's parents allow them to get a mouthful of rotten teeth before taking them to the hospital to get gassed should have been classified as child abuse victims not dental decay statistics. How will this work if the kids don't drink water or take the proper dietary intake? When I moved to this city I expected some biased thinking but not out right collusion in helping industry get rid of toxic waste.

This "project" as Peter Dance referred to it in the May 29th recorded meeting lacks details of the control system to be used and water flow metering to adjust the rate of HFSA injection. It also lacks information on what it will do to the water storage tanks and the combinations of chemical reactions that will take place in the system and their resulting affect on living tissue and organisms. These issues were not covered including a proper response regarding lead leaching in the water delivery system to households or the effect of the ion binding with aluminum.

The issue regarding Dr. Peter Cooney who has been shown to be lying at the City of Hamilton and what he said here in Orillia has been less than honest putting it mildly. This calls into question all the science relating to this issue that has been supplied by health Canada. There is no integrity or fidelity in the draft report delivered by Mr. Peter Dance and I suggest it be done over by an independent panel with input from both sides of the issue. I don't know how he could in all conscience read out loud to the public making the claims that he did.

Mr. Dance couldn't even answer most of the questions asked and he frequently referred questions to Dr. Gardener who has a vested interest to lie about the issue like Dr. Cooney for what ever reason I don't know. What I do know is being paid does not make you professional if you abuse the public trust. I know I have seen a lot of that lately.

This letter has been provided to you as information that misleading and misrepresentations in statements and deliberate exclusion of submitted information has taken place in drafting this report and in disseminating information to the public. It is also to show that there is also excluded information to the public as to the engineering and monitoring of this injection of the proposed HFSA not to be confused with actual fluoride the drug. This whole process has been handled with the intended goal of proceeding with this "project" from the beginning in my opinion. I was told that Dr. Gardeners survey of Orillia citizens which only numbered about 100 in total who he said the majority were in favour outweighed the people against. Currently there are signatures of over 4 times that many against fluoridation. I say there is a serious misrepresentation problem that borders on being fraudulent with the information presented by this report. I say this because misleading advertizing of drugs and their abilities is illegal under the Food and Drug Act.

If the city were honest about this they would have educated the public to all concerns regarding this issue and then held a public vote on the issue rather than hide facts and suppress new findings about the dangers of this toxic chemical HFSA.

Sincerely,

James Upper
OCAF
Council of Canadians

From: JANET DIXON
Sent: Thursday, June 14, 2012 8:37 AM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; andrewhill@bell.net; tonymadden@roger.com
Subject: fluoride

Dear Mayor and Council,

After attending the May 28.2012 meeting I would like to make a comment about the addition of fluoride to Oriilia's city water.

Listening to the comments I learned that fluoride only works to help tooth decay by having direct contact with the tooth. If the actual tooth surface is the only way fluoride can be absorbed to help prevent tooth decay, why would anyone want to flood their entire body system with chemicals when direct contact with the surface of teeth is all that is not only necessary, but effective.
Personally I do not wish to have the water system I help to pay for and use be flooded with any more chemicals than is absolutely necessary. Surely there is some other means to get fluoride on the surface of especially children's teeth; as adults can simply rinse with a fluoride mouthwash, which is more effective than simply drinking a liquid. Is there a sugarless candy gum available, or fluoride rinses which could be distributed at the school level, much like cod liver oil was, which would give the childrens' teeth a thorough dose of fluoride without the entire city having to ingest fluoride which is ineffective. This way lakes, rivers and streams, plants and lawns would be saved from more chemical onslaught.
Please consider alternatives.

Jan Dixon

From: Bill Mindell
Sent: Thursday, June 14, 2012 11:19 AM
To: JASON COVEY, Mayor and Council
Subject: I urge Council to support the staff recommendations to implement fluoridation of Orillia's water system

As you are aware I retired at the end of April from my position as the Director, Clinical Service of the Simcoe Muskoka District Health Unit. In this position I was responsible for all Oral Health programs in the health unit and I chaired the internal health unit committee, with which you worked, on the public consultation to consider fluoridating Orillia's water system.

Although I am retired, no longer connected to the health unit and a resident of Barrie, I am taking the time to write to you to **add my voice of support for the excellent report your department prepared, with the assistance of the health unit, and to urge Council to approve the recommendations for implementation of water fluoridation and the establishment of a capital fund as written**. I am doing this because I feel the decision Council is about to make is truly important - not just for Orillia but also as an example for other local communities as well.

Council has now seen all sides of this debate. It has been typical of fluoridation debates in other jurisdictions and pitted credible professional advice and opinion, and the scientific evidence on which it is based; against the pseudo-science, the fear mongering and the nonsense (and unfortunately intimidation from some) of those opposed. It is now time for Council to take the **leadership** on this issue.

The bottom line fact here is that children in Simcoe County (and by extension the Simcoe Muskoka District Health Unit in which statistics are aggregated) have among the worst teeth in Ontario, and ***the children of Orillia have the worst teeth of the ten largest communities in the health unit***. The health unit does everything it can to improve the oral health of all the children, and particularly children in need, in its jurisdiction, but it can only do so much. It is now up to Council to take the next step to help these children now and to make sure that future generations of children living in Orillia have the best opportunity possible to grow up with healthy teeth and all that is implied with good oral health. Community water fluoridation is a safe, cost effective, proven method of acheiving this.

Council must decide what they intend to do for the future of families who reside in Orillia. They have my support for a YES vote endorsing your report.

Sincerely,

Bill Mindell
Barrie, Ontario

-----Original Message-----
From: Brooke Codlin
Sent: Thursday, June 14, 2012 4:47 PM
To: MAYOR EMAIL
Subject: Don't fluoridate my water

Please please don't fluoridate my water

From: Allen Payie [mailto:bigal069@hotmail.com]
Sent: Thursday, June 14, 2012 6:30 PM
To: MAYOR EMAIL; Patrick Kehoe; thegardys@hotmail.com; Michael Fogarty; Andrew Hill; Tony Madden
Subject: No Fluoridation

Dont poison my Family with Fluoridation! Long time resident and I want my children to live long and healthy lives. Preach tooth brushing not chemicals! Thank you and I hope you listen to the concerns and maybe look on-line to find out the REAL truth about FLUoridation! Allen Payie

---

From: Barker, Bruce [mailto:Barker.Bruce@basco.com]
Sent: Friday, June 15, 2012 9:54 AM
To: MAYOR EMAIL
Subject: fluoride

Please note:

This is my first email to your office.

Please do not waste our tax money and poison our water.

Bruce

From: Gerry Cooper
Sent: Friday, June 15, 2012 1:18 PM
To: JASON COVEY
Cc: Susan Schweitzer
Subject: Assessment of Draft City Report, May 2012 on Fluoridation

Hello Jason:

Attached is my submission in response to the above referenced draft City report.

If you or others at the City have comments or questions, I would be pleased to address them.

Regards,

Gerry Cooper, PEng, BEng, MBA
Public Policy Advisor
People for Safe Drinking Water

Attachment:

Assessment of Orillia Staff May 2012 Draft Report on Fluoridation June 15, 2012

Submitted By: Gerry Cooper, PEng, BEng, MBA
Public Policy Advisor, People for Safe Drinking Water

Introduction

With two notable exceptions, the draft City report was available for public review from May 31 to June 15. Those exceptions were Appendices A and M which contains input from the public at large. Although available, City staff refused to post these appendices on the City's web site thereby denying Orillia's residents with easy and timely access to their content. This amplified an already evident bias in favour of fluoridation as seen in that draft City report, May 2012. Simply, the appendices of the draft City report posted to the website mainly contain content prepared by City staff, the SMDHU, and other proponents of fluoridation.

In essence, the draft City report has not met Orillia Council's five stated objectives for the public consultation process. This shortcoming was compounded by the failure to provide an extension in the time for the public to review the draft report, including a complete set of appendices. As knowledge is power, this could be taken as an abuse of authority. These process problems do not serve well the interests of Council members in addressing their key public policy questions or the needs of residents in securing a balanced, objective and comprehensive perspective on which to base their views and preferences regarding the contentious issue of the fluoridation of their drinking water.

Section 4.5 National and International Organizations that Support Fluoridation

Here is an early sign of the content bias and lack of balance by City staff in this draft report. This section completely ignores the organizations that support fluoride-free drinking water and their reasons for this support. These include:

- The municipal councils of 23 communities across Canada who since 2008 have rejected this practice. Actually 39 such communities have done so since the early 1960s. More are expected to so in the coming months.
- The Canadian Association of Physicians for the Environment – 5,000 members strong.
- The Council of Canadians – active in 70 communities across Canada.
- Great Lakes United – a transborder association of Americans and Canadians dedicated to protecting the water quality of the Great Lakes, including the ending of fluoridation.
- Canadians Opposed to Fluoridation – national website at www.cof-cof.com .
- Fluoride Action Network – US national website at www.fluoridealert.org . See Professionals' Statement to End Fluoridation signed by over 4,000 dentists, doctors, nurses, scientists, water treatment operators, lawyers, activists, etc. Includes 121 professionals in Ontario.
- International Society for Fluoride Research Inc. – a clearing house on scientific research about fluoride. See www.fluorideresearch.org .
- International Academy of Oral Medicine and Toxicology – a Calgary-based network of over 700 dentists, doctors, and medical researchers in North America with a motto of "Show Me the Science". See website at www.iaomt.org .

It must also be recognized that it is wrong to characterize the World Health Organization (WHO) as simply a pro-fluoridation proponent. In its 2007 fluoride policy, WHO sets out a balanced position on fluoride which includes topical as well as systemic options for reducing and controlling tooth decay. In particular, it calls for the use of fluoridation where applicable. This nuance is based on the fact that most of Europe does not fluoridate its drinking water and that most third world countries cannot afford the high capital costs of large scale water treatment and distribution facilities on which fluoridation is based. In the latter case, WHO in 2006 called for the launch of a major campaign for free or reduced-cost fluoride toothpaste and brushes as a preferred preventive option.

As well, the CDC in 1999 declared, based on its review of the scientific literature, that it is the topical application of fluoride (i.e., toothpaste, gels, varnishes) to the surface of teeth in the post-eruptive stage of formation rather than ingestion by fluoridated drinking water in the pre-eruptive stage that provides the most benefit in terms of limiting the onset of tooth decay. The CDC repeated this policy statement in 2001 and it remains in place to this day.

The May 2012 draft City report should be amended to reflect the foregoing additions and clarifications to achieve a better balance and greater objectivity in the information it is providing to the public and councillors.

Section 5 Overview of Fluoridation and its Benefits

By the omission of relevant facts, the draft report misrepresents and misleads in its discussion on the need for, safety of, and effectiveness of fluoridation.

To provide proper context, as noted in the Journal of the American Dental Association in 1984[1], some 85% of cavities occur in the pits and fissures of the chewing surfaces of our teeth and only about 15% occur on smooth surfaces. Fluoride treats only the smooth surfaces, be it topically or systemically applied. (Sealants are applied by dentists as the main means of protecting chewing surfaces from cavities.) Moreover the CDC, per a review it conducted of the scientific literature, found in 1999 that the main dental health benefit (say 75%-85%) of fluoride was attributable to its topical application after the teeth had erupted rather than, as was the prevailing view among dentists, the systemic mechanism of ingesting fluoridated water in the pre-eruptive stage of tooth formation.

Basically then, fluoridating the water only deals with some 2.3% (0.15*0.15) to 3.8% (0.15*0.25) of the cited DMFT or DFMS scores, depending how one defines the minor benefit from fluoridation. The data and interpretation of it presented in the draft City report should be adjusted accordingly. The key point is that the foregoing reduces to insignificance the need for and value of Orillia fluoridating its drinking water.

Funding being sought in this draft report could be better used in an enhanced public education and assistance program targeted directly to Orillia's disadvantaged and focussing on dental hygiene, low-sugar diets, broader distribution of toothpaste, brushes, and flossing devices, and greater leverage of CINOT and Health Smiles programs for preventive sealants, cavity repairs, and other dental problems.

None of the 23 references made in section 5 of the staff report include any toxicological research on the safety of HFSA for human consumption. Yet the onus of proof on safety falls on the proponents of fluoridation. One such proponent, the federal Minister of Health states in her April 4 2012 reply (see copy in Appendix N of the draft report) to the Chair of Peel Region that the Ontario government is responsible for the general safety of drinking water. She also notes that Health Canada recommends that fluoridating chemicals be certified to NSF Standard 60: Drinking Water Treatment Chemicals - Health Effects. While NSF 60 is used by suppliers to certify that co-contaminants in HSFA are at levels less than the prescribed concentrations, the Minister is incorrect in stating that NSF 60 also provides for toxicological studies to be done on HFSA per se. She is also at odds with a Supreme Court of Canada (SCC) judgement in the 1957 case Metropolitan Toronto v. Forest Hill (Village), [1957] S.C.R. 569. The SCC found HFSA to be a medicine for the purpose of treating a human disease, (i.e., tooth decay) rather than simply a chemical additive (like chlorine) for the purpose of making drinking water more pure.

This legal ruling was more recently confirmed in 2005 by the EC Court of Justice. In a landmark case dealing with the classification and regulation of 'functional drinks' in member states of the European Community, it ruled that fluoridated water must be treated as a medicine, and cannot be used to prepare foods or to be in processed foods. The Court found that any foodstuffs or beverages such as fluoridated water, with the aim of treating or preventing disease in human beings or of modify physiological functions in human beings must be regulated as a drug. The Court also found that it must not be used in the preparation of any food or beverage, nor may such food or beverage made with fluoridated water be exported to the European Union until it undergoes proper pharmaceutical scrutiny and is regulated as a medicinal product in the European Union. For further details on this

ruling, see http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX%3A62003CJ0211%3AEN%3APDF .

In further reference to NSF 60, as taken from the February 2008 publication NSF Fact Sheet on Fluoridation Chemicals:

The standard requires a full formulation disclosure of each chemical ingredient in a product. It also requires a toxicology review to determine that the product is safe at its maximum use level and to evaluate potential contaminants in the product. The standard requires testing of the treatment chemical products, typically by dosing these in water at 10 times the maximum use level, so that trace levels of contaminants can be detected. A toxicology evaluation of test results is required to determine if any contaminant concentrations have the potential to cause adverse human health effects.

Per above and the documents in Annex A herein, the NFS limits itself to issuing a certificate of analysis on the concentrations of co-contaminants in HFSA rather than HSFA per se and accepts no liability at all for the human health safety of HFSA for its intended use as a medicine. In the USA, the medicinal use would normally fall to the Food and Drug Administration but its view on HFSA is that it is an unapproved drug. As well, the suppliers set out a disclaimer in their Material Specification Data Sheets waiving any liability for the use of the information or the product for whatever purposes a user (i.e., a municipality or licensed water treatment operator) makes of the product. Hence, the draft City report is wrong in saying or implying that HFSA is a safe drinking water additive unless and until it is proven to be so by at least one randomized, double-blind, controlled long term clinical research study conducted by a third party that has no vested interests in its outcome. This is the gold standard for establishing the safety of drugs.

In short, while HFSA is considered to be a drug, it is not subjected to standard toxicological tests for drugs and thereby cannot be claimed to be safe for human consumption.

Regarding claims of effectiveness, only two of the 23 references (#28 and #29) cited in Section 5 deal directly with fluoridation's purported effectiveness. Other references are either government policy statements rather than primary research papers or are documents exploring possible linkages between socio-economic disparities and tooth decay levels. On the latter, the draft City report fails to acknowledge that in 2011 the leadership of both Black and Hispanic minorities in the USA rejected mandatory fluoridation of their peoples as a violation of their inherent civil rights and because of the health harm it causes them, especially with regards to disproportionately elevated levels of dental fluorosis. See Annex A for details.

In Canada, last year saw the establishment by Dentists Without Borders of the first domestic dental clinic to respond to the worsening state of dental health among the homeless and urban aboriginals in Toronto. This unprecedented development occurred in spite of Toronto, per survey data from the Ontario Association of Public Health Dentistry, having 100% of its population able to easily access fluoridated drinking water. So in the USA and Canada there is dramatic evidence that fluoridation is not an effective public health measure and is not meeting its stated policy objectives of reducing tooth decay while limiting dental fluorosis to very mild or mild stages in no more than 10% of the treated population.

The first research paper cited by the draft City report was The Effectiveness of Water Fluoridation by E. Newbrun, an epidemiological study which appeared in 1989 in the Journal of Public Health Dentistry. It and it alone provided the 20-40% estimate of reduced tooth decay using DFMT scores. Newbrun warned that this result ascribed to fluoridated drinking water was declining due to the high geographic mobility evident in the USA and the widespread use of topical fluoride agents including toothpastes. Subsequent events further reduced the relevance of the Newbrun paper.

In fact this study became obsolete in 1999 when the CDC reported that its review of the scientific literature revealed that the topical application of fluoride (e.g., fluoride toothpaste) and not fluoridated drinking water was the main cause in the general decline of tooth decay. The WHO survey reinforced this in 2005 by showing that some 18 fluoridated and unfluoridated countries had experienced essentially comparable declines in tooth decay rates from 1965 to 2005. In fact, two of the three countries with the lowest DMFT scores (~1DMFT) were unfluoridated Denmark and fluoride-free

Holland. Also in 2005 Komarek, et al demonstrated the existence of an 8-12 month delay in permanent tooth eruption among children in fluoridated European communities compared to those in unfluoridated ones. When adjusted for this time lag, the tooth decay outcomes for both groups were virtually the same. Additional results from some 55 research references on the ineffectiveness of ingesting fluoridated drinking water are cited in chapter 8 (Key Modern Studies) of The Case Against Fluoride, a 2010 book on the systematic review of the science and politics of fluoride, co-authored by Drs. Connett, Beck and Micklem.

The second direct reference on the effectiveness of HFSA is the 1990 paper Recent Trends in Dental Caries on US Children and the Effect of Water Fluoridation, by Brunelle JA et al in the Journal of Dental Research. In contrast to Newbrun's DMFT-based research, Brunelle used DMFS scores (S=Surfaces) as a measure of tooth decay to provide greater precision. A full set of 32 permanent teeth has 128 such surfaces.

In drawing any conclusions from this research paper, the following features of Brunelle's analysis should be noted:

- It is based on 25 year old epidemiological data produced by the National Institute of Dental Research survey of some 38,000 children which was superseded by the NHANES survey of 39,000 children with data released in 2004 that showed further progress in the reduction of tooth decay but further increases in dental fluorosis;
    - Although overall some 8,200 children continuously resident in fluoridated water had about 18% lower DMFS scores than about 8,200 of them resident in non-fluoridated areas, this outcome occurred in smooth tooth surfaces whereas the latter group had lower DMFS scores in teeth with pits, grooves, and fissures.
- while the reproducibility of the tooth decay diagnoses were claimed to be high with a correlation coefficient of 0.6, this is not high when one considers that a 95% + confidence level is the norm in measurement of scientific data;
- no attempt was made to account for significant regional differences in the DMFS scores be they above or below the aggregate averages;
- while caries in pits, groves, and fissures of molars were included in the DMFS scores, no adjustment was made for the established fact that neither topical nor systemic fluoride plays a determinant role in controlling or reducing such caries even though they represent some 85% of the total observed data;
- the use of fluoridated toothpaste in both fluoridated and unfluoridated communities was a confounding factor that was not considered in adjustments to DMFS scores for topical fluoride applications in Table 10 of the paper;
- the paper predates a series of research projects that established fluoridation delays the onset of tooth decay in children by about a year which accounts for the 18% gap in DMFS scores noted in Brunelle's paper;
- the paper on page 12 acknowledged that:
    - "Neither of these NIDR-conducted national epidemiological studies was designed to enquire into the cause of this decline. In fact, because of the multifactorial etiology of caries, it is doubtful that an unequivocal explanation for this trend can be found, though there can be little argument that the ubiquity of fluoride in the environment has been a dominant factor.";
    - "… there was no way to control for either exposure to fluoride in dentifrices or incidental exposure to fluoride in the diet."; and,
    - "…was not surprising that the caries-preventive effect of water fluoridation has appeared to decrease over time, and it can be expected that this will continue.

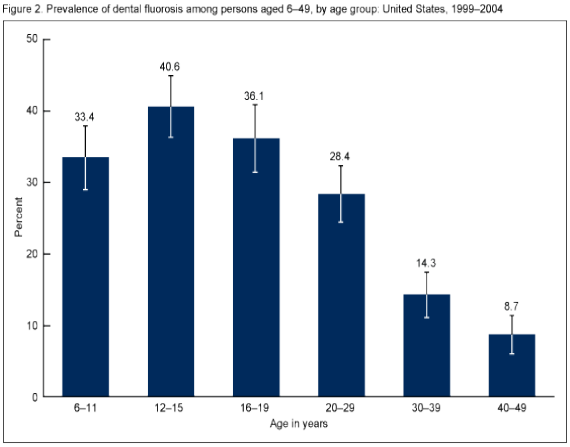
Overall, the foregoing and the results of additional research done in the first decade of the 21st century strongly suggest that the Newbrun and Brunelle papers are no longer relevant to making an informed, current, and comprehensive judgements on the effectiveness and benefits of water fluoridation.

As well, the draft City report neglects to take proper and complete account of other important and more recent references on safety and effectiveness of water fluoridation. Notably these include: the NRC Report, 2006; the Pizzo et al Review, 2007; Warren, Levy, et al, 2009 in the Journal of Public Health Dentistry; 69, no.2:111-115; the Connett, et al book, The Case Against Fluoride, 2010; the Waugh D. Technical Report, 2012 on Human Toxicity, Environmental Impact and Legal Implications available at http://www.enviro.ie/ ; and most recently, the Limeback H, et al reference book Comprehensive Preventive Dentistry, April, 2012 E-PUB.

It appears that city staff and their principal advisor, Simcoe Muskoka District Health Unit have unduly limited their fact-finding in Section 5 of the draft City report to a few outdated scientific references. This does not serve the public interest at all well.

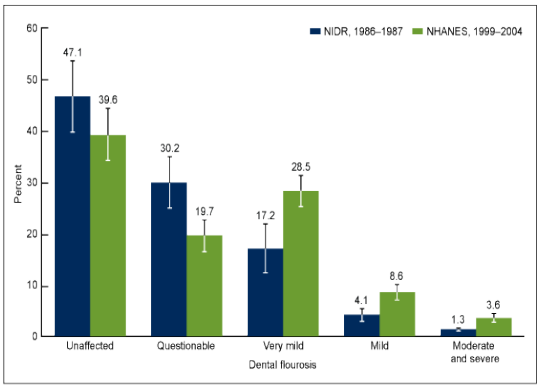
This section of the draft report also does not include an examination of the effectiveness of the dental fluorosis goal of the fluoridation policy. The CDC in November 2010[2] reported that the NHANES 1999-2004 survey data revealed that dental fluorosis existed in some 41% of 12-15 year olds (age by when most adult teeth have erupted) in the USA. See Fig 2. This level is 4 times greater than the CDC's stated policy goal. Also significant is that some 3.6% of these children were afflicted with moderate or severe fluorosis, for about a three-fold increase over 1986-87 NIDR survey results. See Fig 3 below. This clearly shows that neither of the fluoridation policy goals are being met which leads to the conclusion that it is flawed and has failed to serve the public interest in achieving and maintaining good dental health.

Figure 2. Prevalence of dental fluorosis among persons aged 6–49, by age group: United States, 1999–2004



NOTES: Dental fluorosis is defined as having very mild, mild, moderate, or severe forms and is based on Dean's Fluorosis Index. Error bars represent 95% confidence intervals.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 1999–2004.

Figure 3. Change in dental fluorosis prevalence among children aged 12–15 participating in two national surveys: United States, 1986–1987 and 1999–2004



NOTES: Dental fluorosis is defined as having very mild, mild, moderate, or severe forms and is based on Dean's Fluorosis Index. Percentages do not sum to 100 due to rounding. Error bars represent 95% confidence intervals.
SOURCES: CDC/NCHS, National Health and Nutrition Examination Survey, 1999–2004 and National Institute of Dental Research, National Survey of Oral Health in U.S. School Children, 1986–1987.

This situation has spurred repeated calls for further reductions in the so called optimal concentration level of fluoride in drinking water and reconfirmation of the conclusions made in the NRC Report, 2006.

Moderate/severe fluorosis causes structural and functional damage to permanent teeth (see images below) which cannot be reversed but merely covered up with expensive veneers (currently $700-$1400 per tooth with two or more teeth affected) which need to be replaced periodically. So both the prevalence and severity of dental fluorosis in American children appear to be increasing at an alarming rate. Canada lacks comparable surveys on dental fluorosis but given the high similarities in North American life styles and diets, ignoring the USA experience would be neglectful folly.

Moderate/Severe Fluorosis

Photo by David Kennedy, DDS

Severe Fluorosis

Photo by Hardy Limeback, DDS, PhD

Another attempt to measure the effectiveness of fluoridation is presented in the SMDHU January 2009 report on Oral Health in Simcoe and Muskoka. Figure 3 therein is cited to try to show the need for fluoridation in communities such as Orillia that are currently unfluoridated.

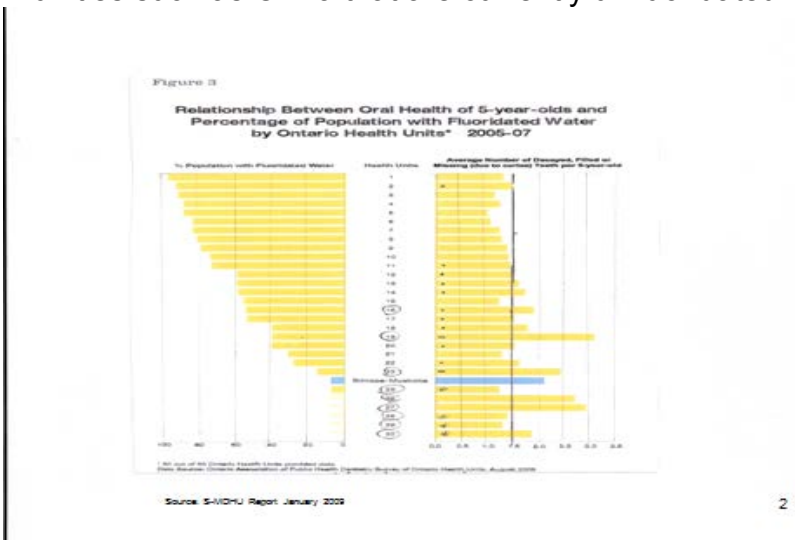


Figure 3

Relationship Between Oral Health of 5-year-olds and Percentage of Population with Fluoridated Water by Ontario Health Units* 2005-07

Source: SMDHU Report January 2009

2

The proof is unconvincing in view of the following inconsistencies:

- 2 of the fluoridated DHUs (19 & 23) have higher DMFTs than SMDHU but no reasons are given;
- 4 unfluoridated DHUs (25, 28, 29, & 30) have lower DMFTs than SMDHU but this isn't explained;
- 10 fluoridated DHUs have DMFTs ranging from 1.0 to 1.4 with fluoridation coverage varying from 75% to 95% vs SMDHU's 2.1 DMFT. The DHUs with highest coverage of fluoridation don't have the lowest DMFT levels but no reasons are given.
- no Fig 3 charts are presented for 7, 9, 13 year olds or the overall average for all age groups.
- DMFT data is not displayed for Orillia and no analysis of Orillia's demographics in tooth decay is provided even though there is a significant First Nations presence.
- the DMFT data is 5-7 years out of date and no data for 6 DHUs is shown. These gaps in timeliness and scope could distort overall results and thereby mislead decision-makers.

The foregoing are major errors and omissions in the January 2009 report which render it unsuitable as a basis for determining whether to fluoridate Orillia's drinking water.

In essence, the foregoing analysis of the need for, effectiveness and safety, and so-called benefits of HSFA lead to the conclusion that there is no common good whatsoever to be realized by fluoridation.

Table 1 on page 13 of the draft City report contains more errors and omissions that need to be corrected. Kingston - May 2008 and Tecumseh - March 2012 should be added to the list of Ontario municipalities that recently ended fluoridation. Churchill – October 2011 should be moved to Canadian communities that ended fluoridation. Okotoks – March 2012, Wynard – March 2012,

Gatineau – May 2010, and Quebec City – April 2008 should be included in the list of Canadian municipalities that also ceased fluoridating their drinking water. In total, 39 Canadian towns and cities have stopped fluoridating their water since the early 1960s. It is also quite likely that other municipalities in Ontario and elsewhere will decide in the coming months to end fluoridation.

The comments in page 14 on a Quebec panel`s musings about the ethics of fluoridation do not represent the position of the Quebec government. To the best of one`s knowledge, there has been no official endorsement of that panel`s recommendation to make fluoridation mandatory on so-called ethical grounds. It would be surprising to see any such response made in the current circumstances unfolding in Quebec, including student unrest, the outcome of recent bi-elections, or the lead up to the next provincial election in Quebec in 2013.

Moreover, the draft City report fails to take into account the basic differences in the civil codes of Quebec and Ontario which reflect contrasting norms, values and traditions. This is especially the case for the varying balances struck in each province on the interplay of individual and collective rights. Reflecting our respective histories, Ontario in this Diamond Jubilee year of Queen Elizabeth II is mindful of its British heritage whereas Quebec is proudly francophone and euro-centric in its culture. As well, in legal terms, Ontario has enshrined into legislation the Fluoridation Act, 1990, The Health Protection and Promotion Act, 1990, the Health Care Consent Act, 1996 and the Safe Drinking Water Act, 2002 which constitute a legal and ethical framework for considering this public health policy issue.

Whereas the Fluoridation Act is discretionary and the Health Protection and Promotion Act is silent on the fluoridation of large scale water treatment facilities, the two most recent statutes are mandatory and apply in full force to public health officials who are licensed physicians or dentists. The current policy and practice of water fluoridation and some of the more recent tendencies exhibited by some Medical Officers of Health could be argued to be at odds with this legislative framework. Perhaps City staff would be well advised to reflect more diligently on these statutes, especially Sections 19 and 20 of the Safe Drinking Water Act and the Purposes section of the Health Care Consent Act.

On page 15, the draft report`s reference to "… the optimal concentration of fluoride … "is misleading and misinformed. Subsequent to the Health Canada expert panel's 2007 recommendation, one of its members, Dr. Steven Levy, in 2009 co-authored another in a series of papers[3] on his Iowa Longitudinal Study. To quote his finding: "… firmly recommending an "optimal" fluoride intake is problematic, and as stated by Burt and Eklund, perhaps it is time that "the term optimal fluoride intake be dropped from common usage." Levy also stated: "… These findings suggest that achieving a caries-free status may have relatively little to do with fluoride *intake*, while fluorosis is clearly more dependent on fluoride intake." Unlike most fluoridation proponents, Levy also adopts a dosage perspective in discussing his findings. Dosage, not concentration, is the operative consideration for physicians in dealing with nutrients and medications, be they drugs or natural health products.

It is instructive that Levy is sufficiently open-minded and responsive to evolving science-based evidence to alter significantly his position on fluoridation. We can only wish this were so for other dentists and public health officials who continue to cling to outdated dogma that has dogged the debate on fluoridation for too long.

References:

1. ***Journal of the American Dental Association 1984;*** 108:448. Other sources: Dental Health Foundation. ***Selected Findings and Recommendations from the California Oral Health Needs Assessment of Children, 1993-1994***. Report at: http://www.dentalhealthfoundation.org/. National Institute of Dental and Craniofacial Research. ***Seal Out Tooth Decay***. See Report at: http://www.nidcr.nih.gov/nidcr.nih.gov. Colgate Dental Health and Oral Hygiene Resource Center. See: http://www.colgate.com/.

2. Beltrán-Aguilar ED, Barker L, Dye BA. Prevalence and Severity of Dental Fluorosis in the United States, 1999-2004. NCHS data brief, no 53. Hyattsville, MD: National Center for Health Statistics. 2010.

3. Warren J, Levy SM, et al 2009. Considerations on Optimal Fluoride Intake Using Dental-Fluorosis and Dental Caries Outcomes Journal of Public Health Dentistry; 2009: 69, 111-115

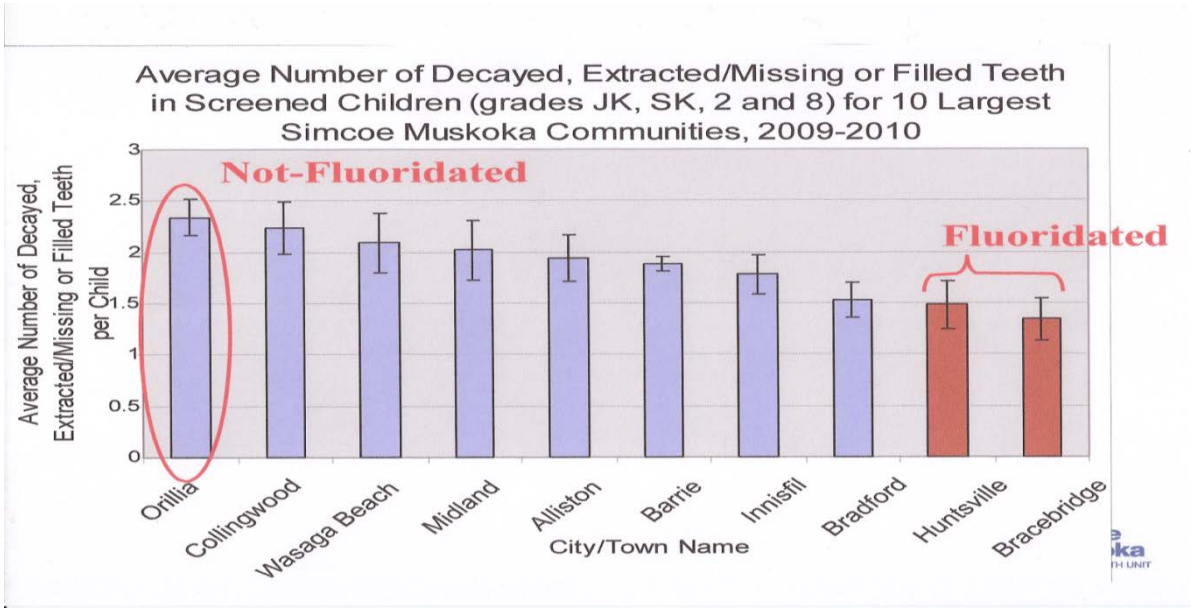
Section 6 Scientific Reviews on Fluoridation

From the list of 19 systematic reviews on pages 17-18 that the SMDHU took into account in varying degrees while conducting its analysis and framing its recommendation to fluoridate Orillia's drinking water, it is apparent that all were cherry picked for making qualified (and unqualified in the case of the five reviews summarized in Appendix H) conclusions in support of fluoridation. The following five systematic reviews were excluded presumably because they were not pro-fluoridation in tone or substance:

- The IAOMT position paper on fluoridation, 2003;
- The US National Academy of Science NRC Review, 2006;
- The Pizzo Review, 2007;
- The Connett, et al book The Case Against Fluoride, 2010;
- The Waugh Technical Review on Human Toxicity, Environmental Impacts and Legal Implications of Water Fluoridation, February 2012; and,
- The Limeback H, et al reference book Comprehensive Preventive Dentistry, April, 2012 E-PUB.

The tendency towards bias, lack of balance or objectivity, and even questionable integrity has at this point in the draft report become a clear pattern of not trying to present Orillia Council with both sides of the fluoridation issue. It may well be necessary for Council to reject the city staff report and set up a third party, non-partisan panel of recognized experts to conduct a quasi-judicial inquiry into this vexing, complex and complicated problem.

Section 7 Oral Health in Orillia



In the chart on page 19, the SMDHU has not presented multiyear trends in DFMT statistics for the 10 communities. Its one point-in-time picture could misrepresent the comparisons as survey methodology is not described. Results could differ by age distribution of screened children in each community which may not be the same. In the above chart, Fluoride-free Bradford has the same DFMT score as fluoridated Huntsville but the SMDHU offers no reasons to explain this conflicting evidence. Neither has the SMDHU provided comparable statistics for dental fluorosis in each community yet tooth decay and dental fluorosis are twin goals of public fluoridation policy. This one-sided analysis is unbalanced, incomplete, and misleading.

The DFMT average for the 8 fluoride-free towns is 1.9 whereas for the 2 fluoridated ones it is 1.4 for a difference of 0.5 DFMT per child or half a tooth. For children in JK, SK, Gr 2 with mostly primary teeth, this is an average decay rate of 10%. For Gr 8 children with mostly

permanent adult teeth (84% or 28 of 32 teeth have come in by 13 years of age), this is an average decay rate of 4%. For Orillia children, the primary decay rate is 12% and the permanent tooth decay rate is 7%. These differences in the two sets of decay rates are marginal and do not warrant the one-size-fits–all approach of mass medicating every resident of Orillia that the SMDHU is advocating. This is especially the case when one recalls that the lead-off comments on Section 5 above note that some 85% of cavities occur in the pits and fissures on the chewing surfaces of our teeth. Fluoride, be it topical or systemic, is ineffective on such surfaces.

Better results can be obtained by using the funds to focus on greater and better quality dental hygiene and nutrition counseling and improved access to Ontario's CINOT and Healthy Smiles dental treatment programs.

The discussion about dental decay on pages 19-20 is very misleading and riddled with a repeated error. Figures 2 and 3 display DMFT data that measure prevalence rather than, as stated therein, severity. This is a major fault which should be corrected before the draft City report is finalized. As well, given the analysis of research papers cited in Section 5, one must disagree strongly with the assertion made just after Figure 3 that fluoridation can be especially effective in preventing severe dental decay in Orillia's children. The exact opposite pertains. This confusion of severity and prevalence is an outright falsehood that reflects the dogma that drives proponents of fluoridation such as the SMDHU. For them, fluoridation has become not only an article of long-standing faith rather than a matter of science-based evidence but the proverbial hammer with every manifestation of tooth decay a nail to be fluoridated. The future health and well-being of our children demands that we all take or more intelligent, balanced, an objective approach in light of the evidence available.

The draft report's discussion about dental fluorosis in Orillia on page 20-21 and in Table 2 raises more doubts and questions than it answers. First is it misleading for the SMDHU to refer to the Canadian Health Measures Survey (2007-2009) which notes the "… the prevalence [of moderate to severe dental fluorosis] is too low to permit reporting."? Or to be of any concern! How representative is it that per page 28 the draft report states that the oral health portion of this federal survey included just 1,072 children aged 6 to 11 years. As of age 11, only about 50% of a child's upper and lower permanent teeth have come in, before making any allowance for the 8 to 12 month delay in eruption that research done by Komarek, et al, 2005 found children residing in fluoridated communities experience. By contrast, the US NIDR and HNANES surveys each included some 39,000 children across the USA and encompassed the full age range from 6 to 19 years old. Applying the usual USA-Canada 10:1 population ratio, this suggests a statistically valid survey for the oral health portion of the Canadian Health Measures Survey should have been some four times greater at around 3,900 rather than just 1,072 children. Moreover, the oral health survey portion only examined some 50% of school age children in east Toronto thereby excluding significant number of children living under the poverty line in other priority areas of Toronto. So there are significant methodological problems with Health Canada survey which the SMDHU has failed to recognize and its reliance on the results ought to be judged accordingly.

As to the local survey, why was it confined to just 118 7 year olds when typically only two to four of a child's 32 permanent teeth had just erupted? This cannot be representative either of the entire population of children in Orillia nor of the state of dental fluorosis among them. And why weren't the corresponding tooth decay results included alongside the fluorosis data? Again, why weren't the results of earlier surveys also presented so that trend analysis could be done? Furthermore, why wasn't a more recent survey done?

As per the US NIDR and NHANES surveys, the full spectrum of age intervals should be

presented to span the three age groups (6-11, 12-15, 16-19 year olds) involved in the eruption of permanent teeth. It is important to recall that the US surveys found that it was the 12-15 age group in the USA rather than a few 7 year olds that has the highest prevalence of dental fluorosis. Why was the methodology used in Orillia not fully described? How did the SMDHU survey team ensure the students being screened had lived exclusively in their respective areas be they fluoridated or unfluoridated? How did the examiners avoid bias and uncertainty in making their assessments of the presence and stage of dental fluorosis?

Table 2 on page 21 shows that the incidence of dental fluorosis in fluoridated areas was small but slightly greater than in unfluoridated areas. Orillia is the outlier as the survey showed an 11.9% incidence of fluorosis vs the 8.3% incidence for 7 year olds in other unfluoridated areas. It is amazing that a 50% difference would arise and astounding that the SMDHU offers no explanations as to why such a difference could possibly exist. Councillors, as part of their due diligence, should demand more information from the SMDHU on this discrepancy.

What seems clear at this point is that the SMDHU survey data was not robust and its approach was not comprehensive which probably makes the survey results incomplete, unrepresentative, and misleading about the trade-offs between reducing tooth decay and containing dental fluorosis to single digit levels.

Section 9 Costs Associated with Providing Oral Health Services in Orillia

On page 24 and again at page 53 a cost-benefit analysis by Griffin S et al is cited that appeared in the January 2001, Volume 61 issue of the Journal of Public Health Dentistry. As seen from below, this is so misleading that for reasons of integrity it should not be included in the draft City report, May 2012.

- The $38/person estimate is based on one American study which used 30 year old data that are no longer relevant.
- Included in the estimated $38/person saved, the paper actually assumed $18.12 per hour wages lost for time taken visiting the dentist - for every person, even children, stay-at-home spouses, or other relatives who aren't earning incomes!
- Most employed income earners would not lose wages either for visiting a dentist.
- The estimate assumes that only water fluoridation is required. NO other mode of fluoride application in a dental office (varnish, gels) or at home (toothpaste, flossing) would be required.
- As the CDC pointed out in 1999 and 2001, the main dental benefit of fluoride is from topical application of erupted teeth rather than ingestion of fluoridated drinking water at earlier stages of tooth development.
- The estimate assumes that costs for treating dental fluorosis would be "negligible" and were not included. Dental fluorosis is rampant (e.g., 41% of the US youth population from 12-15 years old has DF per a CDC brief of November, 2010) and the costs to repair can be significant.
- For example, veneers can cost from $700 to $1,400 per tooth in Ontario as of 2011 and usually at least two teeth are involved. Further, veneers need to be replaced some five times in one’s lifetime. Dental fluorosis, although irreversible, is considered to be “cosmetic” and not normally covered by dental insurance notwithstanding that moderate or severe fluorosis can entail structural damage to teeth.
- Many other costs adverse health effects associated with water fluoridation were not included, such as fluorosis disease of bones and soft tissues (e.g., brain, thyroid, kidney, heart, etc.), costs of special education, institutional care for those harmed by fluorosis diseases.

Section 11 Concerns Raised and Analysis

By way of introduction, one must note that this section of the draft report is primarily based on excerpts, many verbatim, taken from an April 23, 2012 London City staff report. What the value for money is in this approach is open to question. It does repeat a number of serious errors and omissions that exist in that report. For example, the repeated references to the 2011 EC SCHER Report is problematic when one considers that most of the population of the EC benefits from fluoride-free drinking water. And it does thereby cast doubts on the credibility of the SMDHU as a source of expert, science-based advice on the medical, dental, environmental, economic or toxicological aspects of the issue and their interactions.

Dental Fluorosis:
See comments on Section 7 above.

Thyroid Function:
The draft City staff report gives short shrift in its treatment of the NRC Report, 2006. While citing pages 224-236 therein, it fails to refer to page 262 which notes adverse effects on humans are "… associated with fluoride exposures of 0.05-0.13 mg/kg/day when iodine intake was adequate and 0.010.03mg/kg/day when iodine intake was inadequate." Per Connett, et al, 2010 at page 161 these dosages are extremely low, for example "… a child would reach them by drinking one or two glasses of water fluoridated at 1ppm." In the context of medical dosage, rather than the draft report's repetitive mistake of referring to high levels of fluoride, the NRC Report, 2006 flags the likelihood of fluoride-induced adverse thyroid disorders such as hypothyroidism. It calls for more research into the cause-effects-consequences of this association.

Impaired thyroid function can result in problems such as fatigue, obesity, muscle and joint pain, depression, diabetes, high cholesterol, and heart disease. Also, as acknowledged at page 34 of the draft City report, there is a cause-effect relationship between hypothyroidism and IQ deficiency comparable to that which exists because of lead build-up in the brain. A separate submission on the lead-fluoride connection was made to City staff on June 4, 2012. It should be read in conjunction with this assessment of June 15, 2012. It is also an established fact that synthetic thyroid hormone is currently the most frequently prescribed and used drug in North America, especially by our women.

In such circumstances, the prudent course of action is to apply the ethical principle of pre-caution (i.e., first do no harm) by avoiding or ending the fluoridation of our drinking water.

Kidney Function:
Once again the draft City staff report confuses readers by using levels or concentration of fluoride instead of dosage in its comments on adverse health effects. In normal circumstances, some 50% of the fluoride ingested into our bodies is bio-accumulated mainly by calcium-rich organs such as teeth and bone. In those with impaired kidney function or under-developed kidneys (eg., newborns), 75%-85% of ingested fluoride is absorbed.

Significant amounts have also been found in soft tissue organs including the pineal gland, the kidneys (e.g., stones), and even arteries with plaque deposits. Fluoride has a 20 year half-life which means it can cause chronic health problems that take many years to take effect. Nature never intended our bodies to be fluoride sponges as evident by the fact that babies being breast-fed only get a very small dose of fluoride relative to what bottle-fed babies would receive from formula made with fluoridated water. In fact the American Dental Association, in one rare example of invoking the precautionary principle, warns mothers not to use fluoridated drinking water in baby formula. The main reason cited is the inability of the underdeveloped kidneys in infants to excrete more than 25% of the ingested fluoride.

Similarly, many of the elderly among us experience reduced kidney function as a part of the aging process. So their fluoride intake should also be monitored and reduced. But this does not happen via fluoridation as no public health officials monitor the elderly for water consumption or total fluoride uptake. And bear in mind that the Canadian Food Guide still calls for us to ingest a dose of two liters of water each day.

As well, in the USA, the National Kidney Foundation recommends that those with impaired kidney function (e.g., on dialysis), do not use fluoridated drinking water.

Contrary to what the draft City report suggests in its brief and somewhat superficial dismissal of fluoride-related health effects, the foregoing indicates that well-informed authorities consider ingesting fluoride is an adverse risk factor to the health and well-being of the very young, the aging, and those with kidney disease. One example is that the additional fluoride burden in the elderly could lead to embrittlement and fracture of load carrying bones such as the hips. Another is advice to avoid fluoride-bearing anesthetics when undergoing surgeries. All of this is telling us the wise course is to avoid providing fluoridated drinking water to significant and vulnerable subgroups in our communities.

Per page 280 of the NRC Report, 2006 parts of the renal system may be at higher risk of fluoride toxicity due to this organ's role in concentrating fluoride some 50-fold from plasma to urine. It also concludes that ingesting fluoride at a dose of 12 mg/day would increase the risk of causing adverse renal health effects.

Material Handling and Storage:

On pages 42 and 46, the draft City report acknowledges that HSFA is diluted by and claims it to be dissociated into drinking water. Were Orillia Council decide to start fluoridation, it would appear to be contravening section 20 of the Safe Drinking Water Act. Fluoride, be it an ion after dilution/dissociation or present in HFSA, remains second only to arsenic in its toxicity and still the most electrically negative and most reactive element known. F ions can easily combine with hydrogen in the body to create hydrofluoric acid which is highly poisonous and known to attack soft tissues. The draft City report omits to address Section 20 of the SDWA, 2002.

Section 20 prohibits the addition of a toxic substance to drinking water, stating that dilution is no defence and that "... it is not necessary to prove that the thing, if it was diluted when or after it entered the system, continued to result in or could have resulted in a drinking water health hazard. 2002, c. 32, s. 20 (3)." The SMDHU fails to advise that fluoride ions are not safe to human health yet it has a professional duty to do so.

Conclusions:

If sufficient time and a complete version of the draft City report had been made available in this public consultation process, additional comments would have been forthcoming. Even then, the June 4, 2012 submission on fluoride, lead and brain health should be read as an integral part of this submission.

Important information in the draft City report from SMDHU is incomplete, misleading, and outdated. As such, it is not a sound basis on which Orillia Council should decide whether to fluoridate Orillia's water. Council needs to balance benefits and risks, collective and individual rights, economic, environmental, and social values in an open-minded and even-handed way as it and only it can discern what the public interest is. The rebuttals in this assessment are intended to provide councillors with more relevant information.

The foregoing assessment of the draft City report, May 2012 provides important evidence which demonstrates a lack of:

- the need for,
- the effectiveness of,
- the safety of, or
- the legality and medical ethics of fluoridation.

As such, the Orillia Council should confirm it is and will be in the best interests of all residents for the City to continue to provide them with fluoride-free drinking water.

Annex A
Correspondence with NSF International on Standard 60

From: Info, Nsf [mailto:info@nsf.org]
Sent: Wednesday, November 23, 2011 11:00 AM
To: Kallie Miller
Subject: RE: NSF60 Standard
Dear Ms. Miller -
NSF/ANSI 60 is a voluntary American national standard that was developed at the request of the U.S. EPA in the late 1980s. The purpose of this standard is to limit the amount of impurities that a single additive (i.e. fluoride, chlorine, orthophosphate compound, etc.) may introduce into drinking water when used up to a designated maximum usage rate. Please be advised that certification under this standard would not include any clinical studies to address the potential effectiveness of a particular product.
Thank you for your inquiry. Please let us know if you have any further questions about the certification process for such products.
Cheryl Luptowski
NSF Consumer Affairs Officer | info@nsf.org | Consumer Hotline: 888-99-SAFER | Follow us on Facebook and Twitter

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----- Original Message -----
From: Luptowski, Cheryl
To: bill@teachingsmiles.com
Sent: Thursday, February 08, 2007 2:08 PM
Subject: RE: Fluoridation
Dear Dr. Osmunson:
I apologize for the delay you have experienced in receiving a response to your inquiry. I did receive both your email below and your voice mail today on NSF's certification program for fluoridation chemicals and what it covers.
In response to your questions:
A. Does your dietary supplements division test the compounds used in water systems to ensure they are the same pharmaceutical quality as the compounds in the dietary supplements?

A. Our dietary supplements group has no involvement in testing products that are intended for use in drinking water applications. This testing is done by our Drinking Water Treatment Chemical certification program.
B. Does NSF International do toxicology assessments to ensure the fluoride compounds are safe for humans to the level of dietary supplements?
B. Drinking water treatment chemicals are evaluated by NSF to determine their compliance with NSF/ANSI Standard 60. This standard establishes minimum health effects requirements for chemicals used in drinking water applications. The purpose of the standard is to limit the amount of impurities that a single additive may introduce into the water to no more than 10% of the U.S. federal limit when used at the maximum usage rate recommended by the manufacturer.
C. Does NSF International do an assessment of the average exposure received without and with the addition of fluoride to water systems?
C. NSF does not conduct testing on fluoridation products as they are used out in the field. Water utilities are generally responsible for monitoring the amount of fluoride product added to the water to ensure compliance with state or local requirements.
D. Does NSF International do an assessment on the efficacy of the fluoride compounds on dental decay reduction?
D. NSF does not conduct efficacy testing on chemical additives.
Please let us know if we can be of any further assistance.
Cheryl Luptowski
Public Information Officer, NSF International

Correspondence on US Minorities Rejection of Fluoridation

Civil Rights Leaders Call for Halt to Water Fluoridation April 14, 2011

Because fluoride can disproportionately harm poor citizens and black families, Atlanta civil rights leaders, Andrew Young and Dr. Gerald Durley, have asked Georgia legislators to repeal the state's mandatory water fluoridation law.
Andrew Young, former U.N. Ambassador and former Atlanta Mayor, along with Reverend Dr. Gerald Durley, Pastor of

Providence Baptist Church in Atlanta, both inductees in the International Civil Rights Walk of Fame, expressed concerns about the fairness, safety, and full disclosure regarding fluoridation in letters to the state's minority and majority legislative leaders. (1,2)
Fluoride chemicals, added to 96% of Georgia's public drinking water supplies are meant to prevent tooth decay, especially in the poor. Yet, 61% of low-income Georgia third-graders have tooth decay compared to 51% from higher income families - and 33% and 20%, respectively, have untreated cavities showing a dire need for dental care. (3)

"We also have a cavity epidemic today in our inner cities that have been fluoridated for decades," wrote Ambassador Young.
Studies show that despite fluoridation, tooth decay is higher in blacks (4) along with fluoride overexposure symptoms - dental fluorosis or discolored teeth.(5)

Dr. Durley wrote, "The National Research Council (NRC) of the National Academy of Sciences has designated kidney patients, diabetics, seniors, and babies as 'susceptible subpopulations' that are especially vulnerable to harm from ingested fluorides. Black citizens are disproportionately affected by kidney disease and diabetes, and are therefore more impacted by fluorides."(4)

Ambassador Young wrote, "I am most deeply concerned for poor families who have babies: if they cannot afford unfluoridated water for their babies' milk formula, do their babies not count? Of course they do. This is an issue of fairness, civil rights, and compassion. We must find better ways to prevent cavities, such as helping those most at risk for cavities obtain access to the services of a dentist."(5)

Dr. Durley's letter to the legislators also says, "I support the holding of Fluoridegate hearings at the state and national level so we can learn why we haven't been openly told that fluorides build up in the body over time (and) why our government agencies haven't told the black community openly that fluorides disproportionately harm black Americans…"

An American Association for Justice Newsletter for trial lawyers describes potential fluoride legal actions based on personal injury, consumer fraud, and civil rights harm.(6)

In a letter to their state's Health Commissioner, a bipartisan group of Tennessee legislators expressed their concern about fluoridation's undesirable impact on babies and other groups.(7)

A bipartisan group of New York City Council Members has also introduced legislation to stop fluoridation in NYC. (8)

Daniel G. Stockin of The Lillie Center Inc., a Georgia-based firm working to end the practice of fluoridation says, "You can look for even more leaders and persons harmed by fluoridation to speak out now."

The Department of Health and Human Services (HHS) proposes to lower water fluoride levels to alleviate the growing dental fluorosis epidemic. The Fluoride Action Network (FAN) **submitted scientific evidence to HHS** (9) indicating that fluoridation must stop completely to preserve health, documenting that:

• HHS has failed to consider fluoride's impact on the brain. Fluoride has been linked to lowered IQ in 24 human studies, and over 100 animal studies have reported damage to the brain.

• Infants who are fed formula made with fluoridated tap water will receive up to 175 times more fluoride than breast-fed infants. Infants 0-6 months old, the smallest and most vulnerable in our population, were completely excluded from risk calculations in HHS's proposal.

• African-American children and low-income children suffer from the highest rates of dental fluorosis, including the most severe forms of the condition. The HHS has failed to take any steps to redress this inequity, thereby making fluoridation an Environmental Justice issue.

Young stated, "My father was a dentist. I formerly was a strong believer in the benefits of water fluoridation for preventing cavities. But many things that we began to do 50 or more years ago we now no longer do, because we have learned further information that changes our practices and policies. So it is with fluoridation."

Paul Connett, PhD, Director of FAN says "Fluoridation is unnecessary, unethical, the benefits wildly exaggerated and the risks minimized."

References:

1. Letter from Dr. Gerald Durley to Senator Chip Rogers, Senate Majority Leader, Georgia State Capitol, March 9, 2011. http://www.fluoridealert.org/re/durley-3-9-11.pdf (National Research Council info on kidney patients and others as fluoride-susceptible groups at Page 350 (bottom): http://www.nap.edu/openbook.php?record_id=11571&page=350 Page 351 (top): http://www.nap.edu/openbook.php?record_id=11571&page=351
2. Letter from Andrew Young to Chip Rogers, Senate Majority Leader, Georgia State Capitol, March 29, 2011. http://spotsonmyteeth.com/wp-content/uploads/2011/04/Letter-to-Georgia-Legislators-from-Ambassador-Andrew-Young.pdf
3. Oral Health Status of Georgia's Children, Facts at a G lance. http://health.state.ga.us/pdfs/familyhealth/oral/OralHealthStatusofGeorgia%27sChildren.pdf
4. Institute of Medicine of the National Academies. 2011. Advancing Oral Health in America. The National Academies Press. Prepublication. http://books.nap.edu/openbook.php?record_id=13086&page=35
5. Beltrán-Aguilar ED, et al. 2005. Surveillance for Dental Caries, Dental Sealants, Tooth Retention, Edentulism, and Enamel Fluorosis --- United States, 1988--1994 and 1999—2002. MMWR 54(03);1-44. August 26. TABLE 23. • See Table 23, http://www.cdc.gov/mmwr/preview/mmwrhtml/figures/s403a1t23.gif • See report, http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5403a1.htm
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7. Letter from Rep. Frank Nicely, et al., to Commissioner Susan R. Cooper, Department of Health, Nashville, TN. February 7, 2011. http://fluoridealert.org/tn.letter.to.doh.2-7-11.pdf
8. The New York City Council, A Local Law to amend the administrative code of the city of New York, in relation to the fluoridation of water, January 18, 2011. http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=828442&GUID=B1B850E6-5BB5-4CC1-9492-6E1070A72B31&Options=&Search
9. Blank T. 2011. Comments on Proposed HHS Recommendation for Fluoride Concentration in Drinking Water for Prevention of Dental Caries. Prepared for the Department of Health and Human Services. Fluoride Action Network. February 4. PDF submission: http://www.fluoridealert.org/dhhs.fan.submission.feb.2011.pdf HTML format: http://fluoridealert.org/fan-comments.html

Source: Fluoride Action Network

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Civil Rights Violation Regarding Forced Medication

LEAGUE of UNITED LATIN AMERICAN CITIZENS

WHEREAS, the League of United Latin American Citizens is this nation's oldest and largest Latino organization, founded in Corpus Christi, Texas on February 24, 1929; and

WHEREAS, LULAC throughout its history has committed itself to the principles that Latinos have equal access to opportunities in employment, education, housing and healthcare; and

WHEREAS, LULAC advocates for the well-being of, but not exclusively of, Hispanics throughout our country; and

WHEREAS, safe drinking water is a necessity for life; and

WHEREAS, the purpose of a public water supply is to supply water to the entire community which is composed of people with varying health conditions, in varying stages of life, and of varying economic status; not to forcibly mass medicate the population which is a civil rights violation; and

WHEREAS, fluoridation is mass medication of the public through the public water supply; and

WHEREAS, current science shows that fluoridation chemicals pose increased risk to sensitive subpopulations, including infants, the elderly, diabetics, kidney patients, and people with poor nutritional status; and

WHEREAS, minority communities are more highly impacted by fluorides as they historically experience more diabetes and kidney disease; and

WHEREAS, minorities are disproportionately harmed by fluorides as documented by increased rates of dental fluorosis (disfiguration and discoloration of the teeth); and

WHEREAS, the National Research Council in 2006 established that there are large gaps in the research on fluoride's effects on the whole body; a fact that contradicts previous assurances made by public health officials and by elected officials, that fluorides and fluoridation have been exhaustively researched; and

WHEREAS, a growing number of cities and health professionals have rejected fluoridation based on current science and the recognition of a person's right to choose what goes into his/her body; and

WHEREAS, the CDC now recommends that non-fluoridated water be used for infant formula (if parents want to avoid dental fluorosis – a permanent mottling and staining of teeth), which creates an economic hardship for large numbers of families, minority and otherwise; and

WHEREAS, the League of United Latin American Citizens (LULAC), founded in 1929, has historically been a champion of the disenfranchised and a leader in the fight for social and environmental justice; and

WHEREAS, City Council Districts I-6 of San Antonio (predominantly minority districts) voted overwhelmingly that the public water supply should not be contaminated with fluoridation chemicals; and

WHEREAS, the election to fluoridate the water, essentially disenfranchised the right of these minority Districts to safe drinking water for all; and

WHEREAS, the U.S. Health and Human Services and the EPA (January 2011) have recently affirmed the NRC Study results that citizens may be ingesting too much fluoride and that the exposure is primarily from drinking water; and

WHEREAS, the proponents of fluoridation promised a safe and effective dental health additive, but the San Antonio Water System's (SAWS) contract for fluoridation chemicals proves a "bait and switch"; as SAWS is adding the toxic waste by-product of the phosphate fertilizer industry, that has no warranty for its safety and effectiveness for any purpose from the supplier (PENCCO, Inc.) or the source (Mosaic Chemical); and

THEREFORE, BE IT RESOLVED, that LULAC commends efforts by organizations that oppose forced mass medication of the public drinking supplies using fluorides that are industrial grade, toxic waste by-products which contain contaminants (arsenic, lead, mercury) which further endanger life; and

BE IT FURTHER RESOLVED, that LULAC supports efforts by all citizens working to stop forced medication through the public water system because it violates civil rights; and

BE IT FURTHER RESOLVED, that LULAC opposes the public policy of fluoridation because it fails to meet legislative intent; and

BE IT FURTHER RESOLVED, that LULAC demands to know why government agencies entrusted with protecting the public health are more protective of the policy of fluoridation than they are of public health.

Approved this 1st day of July 2011.

Margaret Moran
LULAC National President

From: Lynn Martin
Sent: Friday, June 15, 2012 5:27 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com;
Cc: JASON COVEY; Peter Dance
Subject: Re: Water Fluoridation draft recommendations report

Dear Mayor and councillors

Please, include this as my input regarding the water fluoridation draft recommendations report:
It seems nonsensical to say anything about the draft recommendation report, as it was produced by the pro fluoridation side of the issue, only; I would just be contributing to a biased process that should have been abolished and restarted in a non biased way, long ago. Please, listen to the residents of Orillia, and don't fluoridate our water.

Sincerely,
Lynn Martin
Orillia

From: Marie Martin
Sent: Friday, June 15, 2012 5:30 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; Tony Madden; thegardys@hotmail.com; JASON COVEY; Peter Dance
Subject: Water Fluoridation

Dear Mayor and councillors

A process that sided with pro fluoridation to produce a pro fluoridation report makes the report not worthy of critique. The whole process is a charade. Unfortunately, for the residents of Orillia, like me, water fluoridation is not a joke, like this process. I only hope that you, my city council, can see beyond this one sided charade, and listen to the people of Orillia, who, in large numbers, are asking you not to fluoridate our water.

Include the above in the recommendation report on water fluoridation, please.

With the utmost earnestness,

Marie Martin
Orillia

-----Original Message-----
Sent: Friday, June 15, 2012 7:25 PM
To: MAYOR EMAIL
Cc: Patrick Kehoe; thegardys@hotmail.com; Pete Bowen; lindamurray170@gmail.com; Michael Fogarty; Paul Spears; andrewhill@bell.net; Tony Madden
Subject: fluoridation

To The Orillia City Council:

I want it to be known that I strongly DO NOT support fluoridation of our water in Orillia. I stand behind OCAF (Orillia Citizens Against Fluoridation) and believe that their concerns are very serious and should be carefully studied by City Council before any vote is taken. They have voiced concerns and have also made good suggestions on how to better benefit the public.

Sincerely,
Lynn Murray

From: Susan Schweitzer
Sent: Friday, June 15, 2012 10:56 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; thegardys@hotmail.com; Tony Madden
Cc: JASON COVEY; Peter Dance
Subject: Susan Schweitzer - Submission 1 to Process Regarding Draft Recommendations Report

I do want to bring to light a couple of major exclusions from the report:

DOSE/DOSAGE vs CONCENTRATION
I didn't notice any mention of dose or dosage related to fluoride, in the pro water fluoridation Process draft recommendations on water fluoridation. May I, please, have answers to the following questions, and, please include the questions and answers as part of the final report.

The fluoride concentration amount has been given, but what are the doses (amount of fluoride to be consumed over an interval of time by each individual) and dosages (amount/kg. of body weight to be consumed over an interval of time by each individual)?

How was this determined, by whom, and when. Quote primary science, please.

What happens to the individual when the dose and the dosage are exceeded, for any reason? Please, give your primary source, scientific references.

How are individuals assured of not taking an overdose of fluoride, via water fluoridation, as one person may consume ten times the amount of water another consumes, for example? As well, some people consume very little tap water, and some consume no tap water. How do you propose these people get their dose of fluoride from Orillia's fluoridated water? After all, getting fluoride from only other sources defeats the purpose of water fluoridation.

How do recommended doses/dosages of fluoride compare with the amount of water recommended to be consumed by any individual? For example, for the average, healthy adult living in a temperate climate, The Institute of Medicine determined that an adequate intake (AI) for men is roughly 3 litres of total beverages a day. The AI for women is 2.2 litres of total beverages a day.

What are the doses and dosages for babies, children, adolescents, adults, and seniors, to achieve proposed benefits (using this one variable - age)? How were these determined, by whom, and when? Please, quote primary science, please.

How are other variables (aside from age), that impact the amount of water that may be consumed by any individual, taken into consideration in determining an individuals dose and dosage of fluoride, such as body weight (even babies can vary vastly in weight), level of physical activity, the weather (hot vs cold), and health issues (like kidney problems, pregnancy, and consumption of other medications, for examples) among others?

TRANSDERMAL ABSORPTION OF FLUORIDE

Please, address my concerns and questions, regarding this topic, in the final report:

In the Feb. 29th Forum registered presentation of Tammy Gouweloos, registered dental hygienist, she cited research by Dr. M. Nosal of the University of Calgary, from his human study, "that the fluoride intake is doubled through skin absorption, from bathing and showering in fluoridated water." This was reiterated in the comments section of Feb. 29th, by another lady whom I do not know. (She held up a copy of the study.) If you read the attached letter, you will note that Dr. Nosal confirms what these two ladies told the process. See the second last paragraph of the letter. It is numbered "3)". He found absorption of fluoride, transdermally, from bathing, to be, ". . . quite significant." Please, read the whole letter, as it contains other important information. (This information was within the formal Process, and it was ignored by the writers of the draft.

I phoned Dr. Nosal, at the University of Calgary, on Wed. June 13, 2012, and I read him the portion of the recommendations report, from 11.2.1., that dealt with *Dermal and Inhalation Absorption*. He assured me that, based on his study, currently under peer review by the scientific quarterly *Fluoride*,

fluoride is indeed absorbed through the skin. He also said that the recommendations report material I read him gave no proof that fluoride was not absorbed through the skin. Why did I have to make this call? Based on the above, the report writers should have investigated this.

DISMISSALS
Address my questions and concerns in the final report, please:
Surely this pro fluoridation Process cannot just keep dismissing the work of every credible scientist who determines that water fluoridation is not a good idea. What happened to the "The Case Against Fluoride", anyway? (I bought and gave a copy of this book to the process, pre the March 30th deadline.) These three, credible scientists wrote a whole book on the subject, and it managed to get dismissed by the Process - even with 80 pages of citations. They were all willing to talk to anyone in the Process, too.

U.S. Kids Don't Drink Enough Water

Study Shows Children Drink Less Than the Recommended Amount of Water

By Denise Mann
WebMD Health News
Reviewed by Laura J. Martin, MD
Sept. 24, 2010 -- The amount of water U.S. children drink varies based on their age, but tends to be lower than what is recommended, a study shows.

Despite the well known health benefits of consuming an adequate amount of water, until now there has been little hard data showing how much plain water (from the tap or bottled) kids are drinking.

Researchers analyzed the total water intake of 3,978 children aged 2 to 19 who took part in the National Health and Nutrition Examination Survey from 2005 to 2006. Children ages 2 through 5 drank 1.4 liters of water per day, while children aged 6 to 11 drank 1.6 liters. The amount of water rose to 2.4 liters among adolescents aged 12 to 19, the study showed. On average, adolescents aged 2 to 19 drank 1.9 liters of water per day.

The study is published in the Oct. 1 issue of the *American Journal of Clinical Nutrition*.
All children except those aged 2 to 3 had less than the adequate intake of water as recommended by the Institute of Medicine. More boys than girls reported having at least an adequate intake of water, the researchers report.
Water can come from many sources beside plain water. **The amount of water that came from plain water increased with age from 22% among those children aged 2 to 5 to 33% among 12- to 19-year-olds, the researchers report.**

The main meals were the biggest contributor of beverage moisture, but only a third of the plain water intake. The researchers say this finding suggests that American children of all ages are more likely to drink beverages rather than plain water with meals, suggesting a possible strategy to increase water consumption.

“Efforts to moderate the consumption of sweetened beverages and promote plain water intake should not only continue to promote plain water for snacks, but also should recognize the importance of replacing nonnutritive beverages at meal time with plain water,” conclude study researchers Ashima K. Kant, PhD, and Barry I. Graubard, PhD, of Queens College of the City University of New York.

SOURCES: Kant, A.K. American Journal of Clinical Nutrition, 2010; vol 92: pp 887-896

Attachment: Professor Nosal Letter to Calgary Mayor

From: Susan Schweitzer
Sent: Friday, June 15, 2012 11:40 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; thegardys@hotmail.com; Tony Madden
Cc: JASON COVEY; Peter Dance
Subject: Susan Schweitzer - Submission 2 to Process Regarding Draft Recommendations Report

I am submitting the attached document regarding the draft recommendations.
Thank you. Susan Schweitzer

Attachment:

Please, add this to the final report and, please, address my concerns and questions in the final report: The recommendation to fluoridate is flawed by the bias of a Process that partnered Orillia Public Works with pro fluoridation SMDHU. The Process was not only tainted by this pro fluoridation SMDHU partnership, but by an unauthorized (by City Council) partnership with pro fluoridation Health Canada. Given this, I had to accept (too late) that the report recommendation was never going to be anything but pro fluoridation. In fact, I came to realize (also, too late) the harsh truth that the thousands of pieces of anti water fluoridation information submitted to the process and the untold hours of work put in by the OCAF group of residents were all for nothing, with regard to the Process recommendation.
Of the dozens of biased components in this Process regarding water fluoridation, here is a small sampling, in no particular order:

1) Pro fluoridation SMDHU and pro fluoridation Health Canada (unauthorized) were allowed pre-emptory status at the Feb. 29th forum. They were in the "Introductory Presentations" category, while **all** others were required to register for spots to present, under "Registered Presentations". Anti fluoridationists received no preferential invitations, and, in fact, were given no status in the Process (a huge mystery), at all.
2) At the only part of the public Process that was about inviting the public to acquire information (Feb. 29th), no questions were allowed, full stop. How was anyone who didn't have a clue about fluoridation, before the information forum, supposed to get clear on even the information presented, if no questions were allowed? You know this wasn't right.
3) One of the most disturbing things I discovered in this biased Process was report PW-11-058. I only became aware of this document last week. Are you aware that it details how SMDHU is going to construct messages for your city staff to disseminate to the public regarding water fluoridation, as only one of its many incredibly biased components? (These messages are, by definition, pro fluoridation.)
4) PW-11-058 even discloses that pro fluoridationists are going to run all over town disseminating the pro fluoridation messages, with the backing of the city (as the city agreed to partner with them in the Process). How was any of this ever allowed? (It's bad enough that the SMDHU used tax dollars to put pro fluoridation ads in the newspapers and on the radio, and they got paid wages (tax dollars, again) all at the same time.
   Where were/are the tax dollars for the anti fluoridation side? We had to use our own after tax dollars (disposable income – if there was any), for everything that we have done. This is hardly a fair fight.)
5) The city website page on Fluoridation has only the pro fluoridation messages. I wrote the process about this, and all I got in response was the fact that anti-fluoridation presentations from Feb. 29th were on the website. Huh? How does this change the fact that the actual Fluoridation webpage is all pro fluoridation messages? Where is the balance and lack of bias, there?

6) On page seven of the report, those who prepared it cite the C.O.F.-C.O.F. deputation to council, of May 7th, as if they were kind enough to put it into the Process schedule as something additional they were doing for the anti water fluoridation side of the issue. That is utter nonsense. It is an attempt to mitigate the biased nature of the Process.
   It could never have been scheduled or "unscheduled" by the water fluoridation Process. It was never requested of the Process or granted by the Process, as the water fluoridation Process has no jurisdiction over Deputations to City Council.
   In this case, it was by the mayor's good grace that a deputation was granted to me, for the against fluoridation side of the issue. I chose to select C.O.F. – C.O.F. members for the one and only comprehensive deputation that the mayor wanted to entertain from the against fluoridation side of the issue, at a City Council meeting.
   Please, take this out of your report, in this section, unless you wish to include every date for everything that anyone on both sides of issue did with regard to water fluoridation, in Orillia – in and outside of the Process.

Originally, I was optimistic enough to think that Public Works would force the SMDHU to present the case for not fluoridating (along with the SMDHU's pro fluoridation case), given those thousands of pieces of information we submitted to the Process. Instead, the SMDHU simply took advantage of the process to garner our positions. Needless to say, the SMDHU and Health Canada have tried to bamboozle you into believing that we don't have a leg to stand on, via their one sided recommendation report.

Let's get real. Can you honestly think that there are no arguments against fluoridation, at all? The recommendations are a sham.

Even the name of the report is a misnomer. How can you call it a Public Consultation on Water Fluoridation Report, when it is actually a SMDHU opinions report? The SMDHU could care less what the residents of Orillia think. They are only concerned with pushing the pro fluoridation mandate upon which their livelihoods depend. Why weren't any independently constructed and enacted public surveys undertaken by the Process, just prior to the presentation of the draft report? That is "Public Consultation".

If I hadn't come to the 'party' at the end of January 2012, and if I had been made aware of so many things earlier in the 'game', I would have taken on the Process itself, instead of water fluoridation. That is the real shame in all of this.

The production of an unbiased Process would have meant acquiring independent, non stakeholder parties (for example, out-of-town mediators) to both design and implement a Process. The report would have outlined both cases – for and against water fluoridation (along with logistics, budget, etc.). Then, as it would not have been appropriate for those parties to make a recommendation one way or the other, you and the people of Orillia would have been given the chance to come to your own conclusions.

Such a report would have been presented to all Orillians, to digest and investigate, for a reasonable period of time. Then, Orillians could have made their views known to you, in a manner prescribed by that Process, for another reasonable period of time. If you had decided that this was something that you should vote on, you would have, then, been able to vote the informed will of the people.

Alas, here we are. The only saving grace in all of this is, that regardless of how bogus the Process might have been, it makes no difference what the recommendation from the SMDHU is. All that matters is the will of the people who elected you to uphold their rights and interests.

We still live in a democracy. That democracy allowed the constituents of Orillia to vote for you, our council members, with the public trust that you would uphold not only our rights to fair processes in decision making, but with the absolute certainty that you are there to uphold the will of your constituents.

Though I have no faith in the Process, I have always had faith in you, my mayor and city councillors. Your people have told you, in two newspaper polls, that 80% of us do not want water fluoridation. Your people have spoken to you by email, by telephone, by letter, and in person. Given your conversations with OCAF members about what you have learned from Orillians, and given what

OCAF has relayed to you about 9 out of 10 Orillians not wanting water fluoridation (May 29th, 2012), we know that you are already aware that the vast majority of your people do not want their water fluoridated.
Please, vote the will of the people. Vote against water fluoridation. We are counting on you.
Thank you.
Susan Schweitzer

From: Susan Schweitzer
Sent: Friday, June 15, 2012 11:58 PM
To: MAYOR EMAIL; Patrick Kehoe; Pete Bowen; Linda Murray; Michael Fogarty; Paul Spears; Andrew Hill; thegardys@hotmail.com; Tony Madden
Cc: JASON COVEY; Peter Dance
Subject: Susan Schweitzer - Submission 3 to Process Regarding Draft Recommendations Report

I asked Dr. James Beck (The Case Against Fluoride) to take a few minutes out of his busy schedule to review the draft recommendations. He said that he didn't have time to do a comprehensive review, given his schedule, but he wanted to put out a few notes, for your edification. Below is what he gave me. Please, address his concerns and questions in the final report. Thank you. Susan Schweitzer

p. 9: It is impossible to add just fluoride ions. HFSA differs from CaF_2 , the natural form of fluoride, in its solubility and in its behaviour in the media found in the stomach and elsewhere in the human body.

p. 12: no, not proven either safe or effective. (Dr. Beck figured you had plenty of information to prove that is was neither safe nor effective, at this point, from his book and the anti fluoridationists, so he did not see spending the time to counter this in detail.)

p. 17: The “overall conclusions” are not as stated. In particular the York review concludes that there is not sufficient evidence to conclude that it is either safe or effective. The NRC 2006 review concludes that it is a cause of several diseases and possibly a cause of others. The reviews that report favourably on fluoridation generally were composed of nonscientists and appointed by fluoridating governments. [I didn’t see NRC 2006 in their references for this section.]

p. 24: that $38 saving is a figure created by two bureaucrats, neither a dentist or scientist, to promote fluoridation. It even includes loss of income in going to the dental office for treatment of cavities, which generally doesn’t occur and excludes various costs of fluoridation, including repair for dental fluorosis.

p. 26: NSF by its own admission has not certified, by meeting their Standard 60, hydrofluorosilicic acid or its sodium salt.

p. 27: in section 10.1, the authors ignore fact that HFSA does not completely hydrolyze at pH 5.6 and lower. The important point is what happens in the stomach at pH about 2, Toxic silicates form and much HF.

p. 28: Table 8, I believe, is based on a survey of 15 Canadian cities, 5 fluoridated and 10 not fluoridated, a grossly inadequate sampling. And it doesn’t present the prevalences in the fluoridated and nonfluoridated cities separately, thus concealing the association of fluoridation with higher dental fluoriosis.

p. 29: The SCHER report is not credible. There is abundant evidence of association of fluoridation with thyroid deficiency.

p. 33: The Bassin et al. paper is strikingly understated (it showed a 5-7 fold increase) and was well designed. The Kim et al. paper is a sham. The authors themselves say in the paper that it has nothing to do with the Bassin work. It is so ill-designed as to be a farce.

p. 34: pineal gland—They ignore the menarche delay found in the Newburgh-Kingston study.

p. 40: third paragraph of section 11.4.1—Do the data for a comparison of Quebec and Ontario exist. Where did the authors of this report find this data?

p. 40: fourth paragraph— The York review and several research papers say that it is not shown that such inequalities are reduced by fluoridation.

up. 41: Imposition of measures intended to prevent or treat disease can be justified only where the disease is contagious and very serious and where quarantine is impossible. A comparison of fluoridation with enriching salt with iodide is nonsense. Fluoride is not a nutrient. Iodide is a nutrient and there is a wide margin between effective lower limit in the diet and toxic higher limit, such that controlling the amount in a food can assure a dose with these limits. This applies to vitamin D in milk as well. Not so with fluoride in tap water.

pp. 41-42: The authors seem to have failed on their stated commitment to peer-reviewed research reports, as their statements on efficacy and toxicity contradict findings reported in peer-reviewed papers in credible journals, hundreds of them.

p. 46: The NSF states that HFSA does not meet the NSF/ANSI Standard 60.

From: Colleen O'Neill
Sent: Friday, June 15, 2012 12:36 PM
To: JASON COVEY
Cc: Andrew Hill; Linda Murray; MAYOR EMAIL; Michael Fogarty; Patrick Kehoe; Paul Spears; Pete Bowen; Tony Madden; Wayne Gardy
Subject: Water Fluoridation

"Our task must be to be free ourselves by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty." Albert Einstein

We in this area are blessed to live on the shore of two beautiful fresh water lakes. People love to come to Orillia to live, work and play and it is no wonder our ancestors settled here. For thousands of years people fished at the Narrows and do so to this day. Being close to fresh water is a blessing and a responsibility. We are grateful.

In recent years we have sadly watched the deterioration of Lake Simcoe and Lake Couchiching but are heartened by the concern of our Federal and Provincial Governments. The purpose of the Lake Simcoe Protection Act, December 2008, "is to protect and restore the ecological health of the Lake Simcoe Watershed."

The Public Works Department and the workers at the Water Treatment plant of the City of Orillia are to be commended for improving the quality and taste of the drinking water supplied to residents, notably by installing the air stripper to remove volatile organic compounds.

Imagine, if you will, that you are thirsty, you turn on your kitchen tap and pour yourself a refreshing glass of water supplied by the City of Orillia. This water, so necessary for life, flows through your body and revives you. Imagine that you are certain that it is safe and good for your health. Imagine that you also feel quite comfortable with your children drinking it, bathing and playing in it.

Let's keep our water free from the addition of more chemicals and heavy metals. Please do not fluoridate Orillia's water.

APPENDIX B

SUMMARY OF PRESENTATION TO CITY STAFF

November 24, 2011

Fluoridation Presentations - Questions and Answers

Presentation 1 (1:00 p.m. to 1:45 p.m.)

Q. Why did they think Orillia was so high?
A. Don't know for sure – low income, lower education, water not fluoridated.

Q. Would it help improve dental/oral health status?
A. Yes.

Q. Have there been any comparisons with surface water and well water?
A. Not really, but we are confident that it is not an issue.

Q. Why do counties go with it and then switch?
A. Councils/political – have other means or spend more money in/on getting it into the population.

Q. Is there any carry through to Biosolids?
A. No.

Presentation 2 (2:00 p.m. to 2:45 p.m.)

Q. You mention a con as Fluorosis – are there any others?
A. That is the major one. Political / public opposition has historically been another. (explained history of fluoride)

Q. It was a good presentation but did not find it balanced. What happened with Calgary?
A. There was a history of an ongoing political battle whether or not fluoride was good or bad – there was no evidence proving it bad.

Q. What about the handlers?
A. This is an occupational question that should be answered by an expert in operations. Imagine it is similar to handling chlorine so very carefully.

Q. It would not be natural fluoride being added to the water so the manmade must have other additives – what is in it?
A. (*Sorry – I missed the name*) but it is a co-produce from fertilizer / rock concentrated and added to the water. It should be very closely monitored. They had not heard of any side effect issues with any of the other additives.

Q. Any way of opting out of having it added to the water?
A. It will be an all or none decision. If it happens there is reverse osmosis and that would be a personal expense and you would be responsible for maintenance. There is the option of bottled water but at SMDHU they are more supportive of City water than bottled.

Q. If it is added to the water supply and eventually exits as wastewater into the lake, does it dissipate?
A. It immediately disperses and is not detrimental to the environment.

Q. When it goes in to the system at a certain concentrate does it go out at the same concentrate?
A. It is very stable – some people think it is wasteful but you could say that of chlorine use as well. It is very cost effective when it comes to oral health.

Q. I think we are higher because kids are not monitored as much these days, eat properly, etc. and it's been a family's lifestyle choice. Why is everyone subjected to it?
A. It will be a democracy in the end whether or not it will go and it will not be easy. There will be quite a lot of people for it and against it. It will not be easy. It will definitely benefit oral health in poorer income levels if it goes through.

Q. Will it help the crack heads and heroin addicts with their teeth?
A. Actually yes – over time it will if they drink it.

Q. A lot of kids don't drink water – can they absorb it by having showers.
A. No but they can obtain it in the foods that are processed/prepared in fluoridated water.

Community Water Fluoridation

- Public consultation process with assistance from Simcoe Muskoka District Health Unit (SMDHU)
- 2009 SMDHU report
- Council has directed Public Works to:
  - Report on costs
  - Develop and carry out public consultation process with SMDHU

Public Consultation Objectives

- Provide unbiased, factual info about fluoridation to Council
- Raise awareness about fluoridation among the citizens of Orillia
- Provide opportunity to hear about and be heard about fluoridation
- Achieve an open, transparent and respectful process

Public Forums

- Feb 29, 2012 – 1st Public Forum (Information gathering)
- May 29, 2012 – 2nd Public Forum (Reporting back)
- June 2012 – Report to Council
- Both public forums will take place in the evening at the Orillia City Centre, Council Chambers

More Information

- City of Orillia website: www.orillia.ca
- Contact me:

  Jason R. Covey, P. Eng.

  Water & Wastewater Engineer

  Public Works - Engineering Division

  City of Orillia

  705-325-2227 or jcovey@orillia.ca
- Simcoe Muskoka District Health Unit

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Your Health Connection

Community Water Fluoridation:

Begin a Legacy of Healthy Teeth in Orillia

Presentation to:
Orillia Public Works Department
November 24, 2011

Why we're here

- SMDHU is responsible for public health issues and is providing health advice to the City of Orillia on Community Water Fluoridation (CWF) during its public consultation process
- Orillia has never had Community Water Fluoridation
  - Among the 10 largest communities in Simcoe Muskoka, **elementary school children in Orillia have the most severely decayed teeth** (SMDHU screening data, 2009-2010)
- Fluoridation is a **proven safe and effective way to improve oral health** by reducing tooth decay and cavities
- Fluoridation is a challenging, polarizing issue
  - ***Our goal: Address any misconceptions and provide accurate, up-to-date information***

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What is fluoride?

- Fluoride **naturally occurs** in rocks, soil, air and water
- **Most natural water sources in Ontario have less fluoride than municipal fluoridated water systems (too low to protect teeth)**
- Some areas: At much greater concentrations (>5x average levels) – but none in Ontario

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How does fluoride work?

- **Fluoride makes the outer layer of teeth (the enamel) stronger**
- When the outer layer is strong, teeth are less likely to develop cavities
- Fluoride protects teeth in two ways. Water fluoridation does both:
  - ***Topical***: delivered to the surface of the teeth.
  - ***Systemic***: fluoride is ingested into the body and is incorporated into the tooth structures

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What is community water fluoridation?

- It is the process whereby fluoride is added to the water supply and adjusted to a level that will **optimize dental benefits while avoiding adverse effects**
- Fluoride additives are **required to meet rigorous standards** of quality and purity before they can be used and the process is **carefully monitored and controlled**
- The current Maximum Acceptable Concentration of fluoride in drinking water is 1.5 parts per million (ppm) and **Health Canada recommends an optimal level of 0.7 ppm for dental benefits**
- In **Ontario**, it is recommended that drinking water systems that fluoridate maintain a range of **0.5 to 0.8 ppm fluoride**

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Water fluoridation in Ontario

- In Ontario, **76%** of the population receives fluoridated community water (Health Canada, 2007)
  - District of Muskoka: **51%**
  - Simcoe County: **2%**
  - Simcoe-Muskoka combined: **7%**
- Opposition in Waterloo & Calgary resulted in the discontinuation of fluoridation
- Recent challenges to fluoridation in Toronto, Peel, Hamilton, Muskoka, Tottenham, Lethbridge and Cape Breton
  - **All have reaffirmed their commitment to CWF**

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CWF reduces tooth decay

- Studies show that community water fluoridation **reduces tooth decay by 20% to 40%**[1]
- **Beneficial to all ages**, in both primary and permanent teeth
- Effect is seen **in addition** to personal dental care (brushing/flossing/dental care)
- **Particularly needed for vulnerable, low-income populations**

[1] Newbrun E. Effectiveness of water fluoridation. J. Public Health Dent 1989; 49(5):279-89 and Brunelle JA , Carlos JP. Recent trends in dental caries in US children and the effect of water fluoridation. J Dent Res 1990; 69(Spec Iss): 723-7

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Poor oral health can impact more than just the teeth

- Recent Ontario study: there are **more ER visits for non-traumatic dental problems than for diabetes and high blood pressure diseases**[1]
- Dental and other infections – not only affect teeth and gums, but there's **potential for spread to other parts of mouth and face**
- Studies have shown that **poor oral health impacts children's development**:
  - Limits food choices
  - Impairs speech development
  - Repeated absences from school
  - Trouble concentrating or learning
  - Loss of self-esteem (appearance and poor school performance)

[1]Community Dentistry and Oral Epidemiology, August 2009

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Community water fluoridation safety

- Systematic reviews conclude that community water fluoridation **does not cause** any of the following: *cancer, bone fractures, reduced intelligence, kidney failure, immunotoxicity, reproductive and developmental toxicity, DNA toxicity, neurotoxicity or environmental impacts*[1]
- Levels of fluoride added in water are carefully monitored to an optimal level of 0.7 ppm. At this level, risk of fluorosis is exceedingly low.
  - Fluorosis (mild): fine white striations across the crowns of teeth
- Issue in children: inadvertent ingestion of toothpaste

Vermont Department of Health

[1] Issues raised by those opposed to fluoridation

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Major scientific research and reviews

- Health Canada Expert Panel, 2007
- Oral Health in America: A Report of the Surgeon General, 2000
- Systematic Review of Water Fluoridation. UK/International study, 2000
- Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. US CDC, 2001
- Forum on Fluoridation. Ireland, 2001
- A Systematic Review of the Efficacy and Safety of Fluoridation. National Health and Medical Research Council, Australian Government, 2007

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Who supports CWF?

Orillia

- Simcoe Muskoka District Health Unit Board of Health
- Leadership Council of the North Simcoe Muskoka LHIN
- Board of Directors, Orillia Soldiers' Memorial Hospital
- Department of Family Medicine, Orillia Soldiers' Memorial Hospital
- Department of Paediatric and Neonatal Medicine, Orillia Soldiers' Memorial Hospital
- Medical Advisory Committee, Orillia Soldiers' Memorial Hospital

Ontario

- Ontario Association of Public Health Dentistry
- Royal College of Dental Surgeons of Ontario
- Chief Medical Officer of Health of Ontario
- Ontario Medical Association
- Association of Local Public Health Agencies (alPHa)
- Ontario Dental Association
- Ontario College of Dental Hygienists

Canada

- Health Canada
- Canadian Association of Public Health Dentistry
- Canadian Dental Association
- Canadian Public Health Association
- Canadian Pediatric Society
- Canadian Cancer Society

International

- World Health Organization (WHO)
- Pan American Health Organization (PAHO)
- Centers for Disease Control and Prevention (CDC)
- Recent US Surgeon General's Report
- Federation Dentaire Internationale (FDI)
- American Cancer Society
- American Medical / Dental Associations

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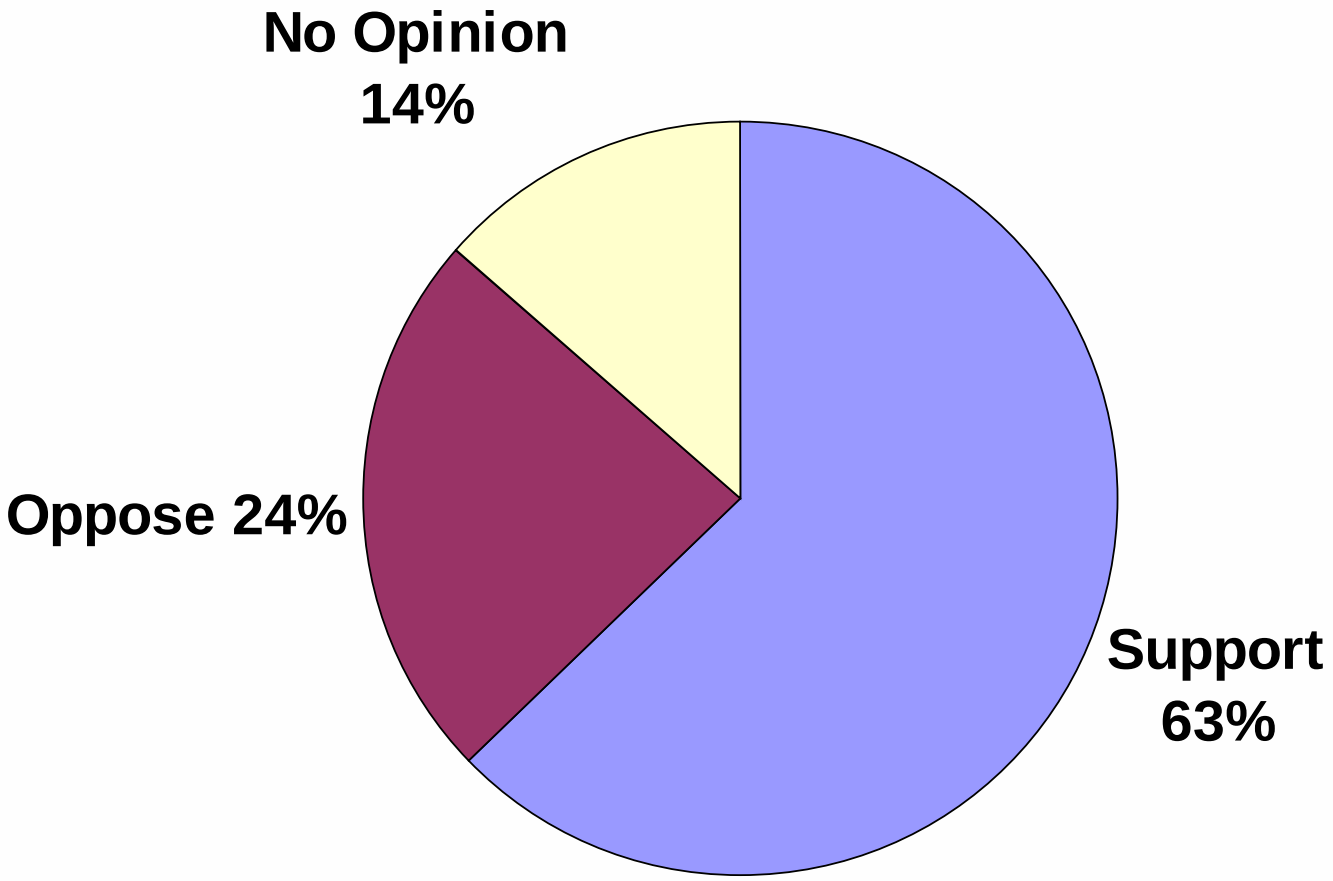
Public support for adding fluoride to municipal water in Orillia, 2009



Data source: Rapid Risk Factor Surveillance System (RRFSS), Simcoe Muskoka District Health Unit, Cycles 1-3 (2009)

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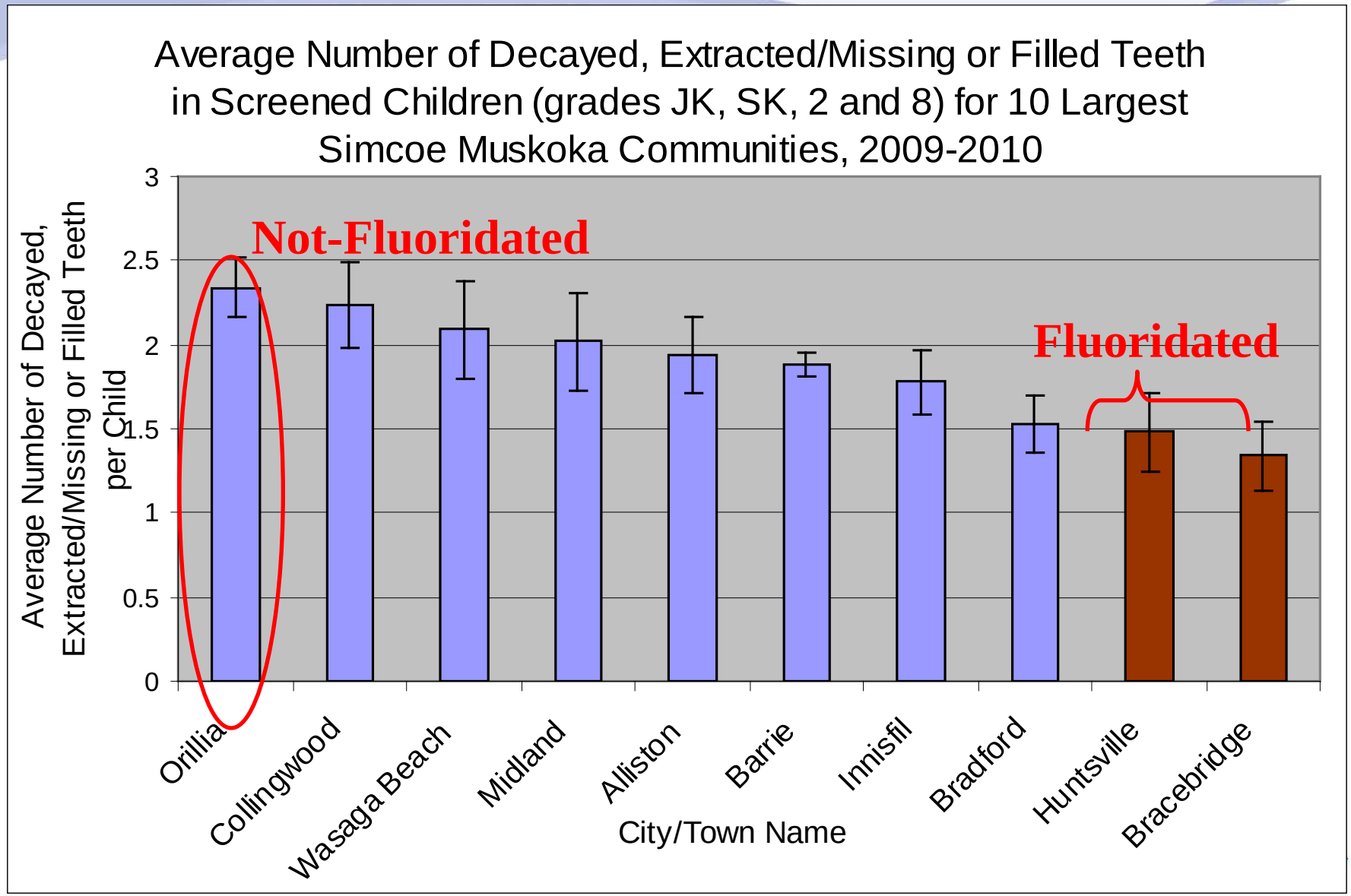
Children in communities in Simcoe Muskoka with water fluoridation have fewer cavities



Fluoridation makes a difference: Simcoe Muskoka compared to other areas in Ontario

Fewer Decayed Teeth & More Cavity-Free Teeth

Region	7-Yr deft/DMFT (Decayed Teeth)	7-Yr % Caries Free (Healthy Teeth)
Halton (90% Fluoridated)	1.96	58
Simcoe Muskoka (7% Fluoridated)	**3.02**	**44.6**
Ontario (76% Fluoridated)	2.49	47.8

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CWF reduces dental program costs

Data: Spending for Dental Programs: Health Unit and Municipal Costs (2009)

Health Unit	Halton 90% Fluoridated	Simcoe Muskoka 7% Fluoridated
CINOT Spending	$357,965	$824,750
(25% Municipal dollars)	($89,491)	($206,188)
OW Dental <18 Yr Spending	$109,280	$421,075
(20% Municipal dollars)	($21,856)	($84,215)
OW Dental Adult Spending	$225,107	$357,501
(20% Municipal dollars)	($45,021)	($71,500)
OW Adult dentures	$160,360	$654,603
(20% Municipal dollars)	($32,072)	($130,921)
Total Spending	$852,712	$2,257,929
(Municipal Dollars)	($188,440)	($492,824)

CINOT = Children in Need of Treatment (Dental Program); OW = Ontario Works (Dental Program)

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Benefits of CWF

- **Evidence of both safety and benefits extremely strong**
- Similar responsibility to:
  - *Treating water with chlorine to provide safe drinking water*
  - *Adding vitamin D to milk to prevent rickets and ensure healthy bones*
  - *Adding iodine to salt to ensure healthy physical and mental development*
- US Centers for Disease Control has recognized water fluoridation as **one of 10 great public health achievements of the 20th century**
- **Every $1 invested in community water fluoridation yields about $38 in savings each year** from fewer cavities treated[1]

[1]J Publ Health Dent 2001;61(2):78–86

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Conclusions

- The value of community water fluoridation should not be underestimated – it is **one of the greatest preventive measures we have in the fight against dental decay**
- It is **a safe and effective public health measure that addresses inequalities in health, and benefits all members of the community**
- It **helps contain the costs of health and dental care services**
- For more information, visit the health unit's website at: **www.simcoemuskokahealth.org**

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Questions?

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Early Fluoridation History

- **1901-1933**: research by F. McKay into the cause of a form of mottled teeth called “Colorado Brown Stain” which were also cavity-free
- **1933-45**: research focused on the relationships between F concentration, fluorosis and tooth decay established that 1 ppm (1mg/L) F was associated with substantially fewer cavities and a mild increase in fluorosis but of no medical or cosmetic concern

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More Fluoridation History

- **1945 to Present**: Focused on adding F to community water supplies
  - **1945**:
    - In January added to **Grand Rapids, Michigan** water system
    - First Canadian City – **Brantford, Ontario**
    - **1945- 1962**: Brantford – Stratford – Sarnia study
  - **By 1950**: CWF was official USPHS policy
  - **By 1960**: 50 million Americans were on CWF
  - **By 2006**: 69% of U.S. population on CWF (includes 3% on naturally fluoridated municipal water); 62% of the total population

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Social History

- **1950s and early 60s**: Generally thought of as high points of scientific optimism and faith in experts. Reality was growing anxiety about medical and scientific progress and expert opinion
  - Concerns over nuclear fallout
  - DDT and other pesticides
  - Doctors and dentists might be influenced by large corporations
  - Further research would show more dangers not yet known
  - Also a persistent interest in alternative medicine
  - CWF was a flashpoint and cities across the U.S. and Canada debated whether or not to do it
- **Late 1960s and early 1970s**:
  - Revolt against experts more pronounced
  - Political arguments had appeal for people on both the right (e.g. individual rights) and the left (e.g. environmentalists)

1950s Opposition

- **Health Allegations**: F accumulates in the body; people are allergic; it causes cancer, heart disease, kidney disease, damages intelligence, skeletal fluorosis; environmental toxicity; etc.
- **Industrial Allegations**: It's a *"toxic hazardous waste product of the aluminum industry";* it's a means for the aluminum industry to get rid of toxic waste which was very expensive to get rid of properly
- **Civil Libertarian Issues**: a conflict between individual rights and the common good; forced "medication" without consent (legal challenges raised)
- **Led by**: (a few) doctors, dentists, researchers; alternative medical practitioners; health food store operators; members of religious and political minority groups

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Opposition Today

- Same issues and people
- Key opposition we heard from in Muskoka and in Ontario generally:
    - an Optometrist,
    - an Orthomolecular Nutritionist,
    - a Bachelor of Physical and Health education
    - a small number of anti-fluoridation scientists

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Why are we confident

- **Science**:
  Use a systematic approach in reviewing evidence

  Do not “cherry pick” evidence

  Can only report and draw conclusions from what has been observed
- **65 years of observation** on approximately **300 million people** at a time
- **Not likely something was missed!**

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Orillia History

- **1966**:
  - June 1st: Passed a by-law authorizing CWF
  - November 7th: Passed a by-law putting the question to voters pursuant to the Fluoridation Act:
    - *Are you in favour of the discontinuance of the fluoridation of the public water supply of this municipality?*
  - November 15th: Passed a by-law to provide for the taking of the vote
    - Yes – 4,223 No – 1,838
- **Late 1970's - 1980's**: Council may have discussed CWF again but did not pursue it
- **2009**: Simcoe Muskoka District Health Unit report on the state of Oral Health gets Council attention; Council approved a public consultation
- **2011**: In June Council reaffirmed that it would hold a public consultation

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Additional Information

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Fluoridation is inexpensive

Municipality	Total Water Treatment Costs	Fluoridation Costs	% of Total Costs	Per Capita Costs for Water Treatment	Per Capita Costs for Fluoridation
Muskoka	$2,120,000	$43,200	2%	$36.83	$0.75
Huntsville	$424,000	$17,500	4%	$23.20	$0.96

Communications with A.J. White, Commissioner of Engineering and Public Works, District Municipality of Muskoka

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Alternative costs of delivering fluoride to at risk populations

Program Delivery	Population	Staff	Staffing & Operating Costs	Capital Costs	Total Costs
Public Health	180,332 All children seniors + LICO	36 FTE	$5,973,518	$9,016,600	**$14,990,118**
Public Health	30,967 Pop. under LICO	6 FTE	$1,000,910	$1,500,000	**$2,500,910**
Private Office	180,332 All children seniors + LICO	1.5 FTE	$17,234,5000	$81,600	**$17,316,100**
Mail Brushes and F Toothpaste	224,705 All private dwellings	3 FTE	$1,870,985	$163,200	**$2,035,185**

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Local Water Use Data

- 2009: Over 1,000 adults (18+) in Simcoe County asked questions about drinking water and fluoride:
  - 74% get their tap water from a municipal source
  - 71% use their tap water for drinking
  - 38% of those on municipal water think that fluoride has been added & 49% don't know if fluoride has been added to their drinking water

- Of this, about 100 were surveyed in Orillia:
  - 73% get their tap water from a municipal source
  - 68% use their tap water for drinking
  - **25% of those on municipal water think that fluoride has been added & 60% don't know if fluoride has been added to their drinking water**

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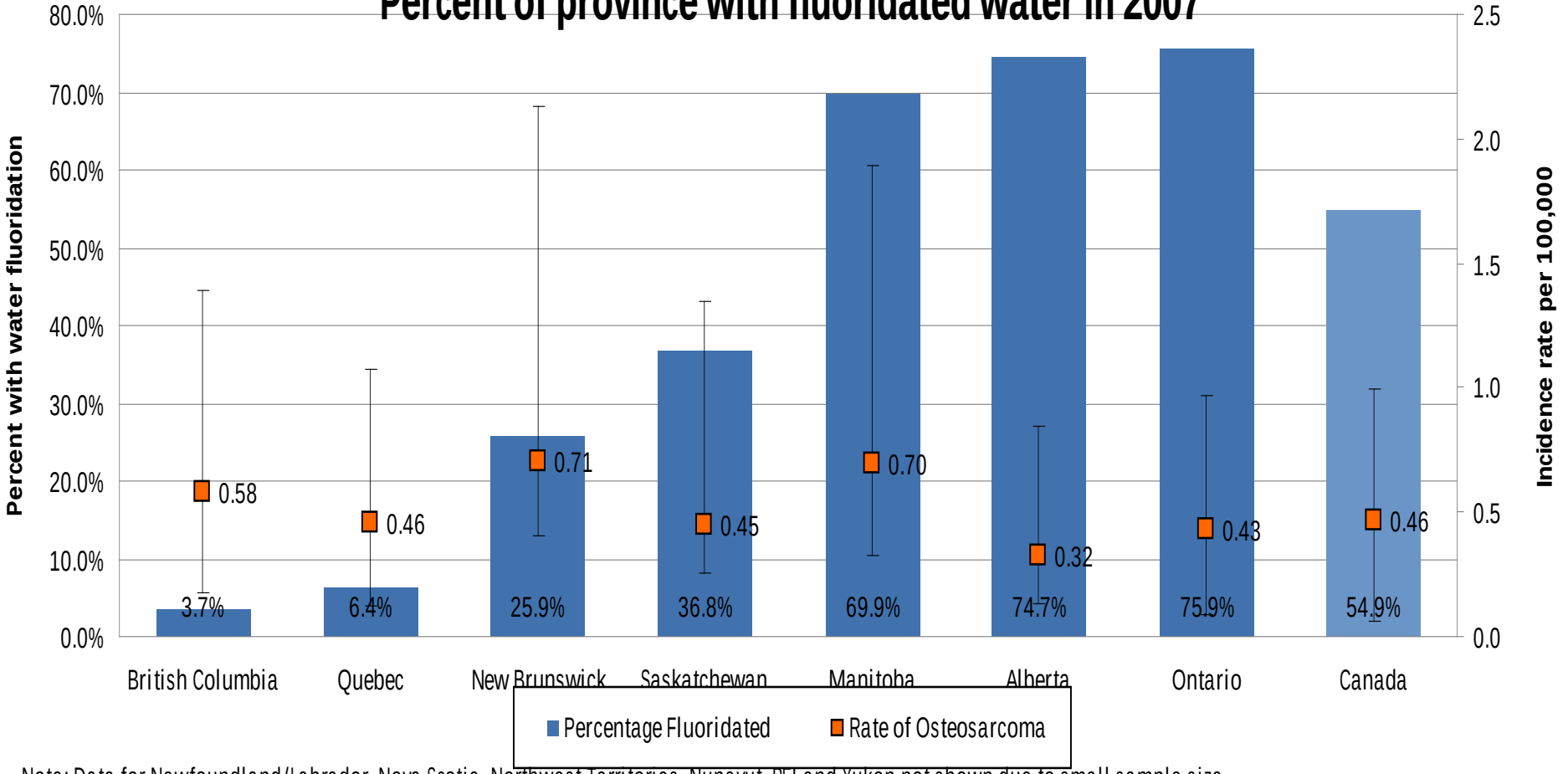
MIDDLESEX-LONDON HEALTH UNIT

Standardized incidence rates of Osteosarcoma per 100,000 males, aged 00-19, 1998-2007 combined, by province And Percent of province with fluoridated water in 2007



Note: Data for Newfoundland/Labrador, Nova Scotia, Northwest Territories, Nunavut, PEI and Yukon not shown due to small sample size

The data contained in this table were provided to the Middlesex-London Health Unit from the Canadian Cancer Registry database at Statistics Canada with the knowledge and consent of the provincial and territorial cancer registries which supply the data to Statistics Canada. Their cooperation is gratefully acknowledged.

APPENDIX C

COMMUNITY GROUP MEETING SUMMARIES

CWF Public Presentation Recording Sheet

Group:	Orillia Intelligent Elders Seniors Group
Date:	16 January 2012
Time:	2:00 – 3:00 p.m.
Location:	Senior's Community Centre – 56 West St. North, Orillia
Presenter:	Jason Covey (City of Orillia) & Dr. Charles Gardner (SMDHU)
Recorder:	Megan Williams

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
Jason and Dr. Gardner were introduced. Jason provided a 10 minute overview of how fluoride is added to the community water system. He also described Orillia's public consultation process on community water fluoridation (CWF). Q: Haven't we had fluoride in the Orillia water system before? A: Jason provided an overview of the history of CWF in Orillia. Dr. Gardner provided his understanding of the history as well. Q: Why does the water taste so bad? A: Peter Dance provided an explanation of the use of granular activated carbon filter media to improve taste and odour of water from the water filtration plant. This media is reaching the end of its useable life, and is scheduled to be replaced this year. Dr. Gardner delivered a 20 minute presentation about CWF, including: the need for CWF in Orillia; its safety, effectiveness and dental health benefits; the research and evidence supporting CWF; and its history. A question and answer period followed the presentations. Q: Where is fluoride from? Is it natural or manufactured? A: In its natural state it is in the soil. If it is added in a community water system, it is a chemical by-product of fertilizer production that is added into the water system in safe and monitored amounts. Q: Was it the cost of CWF that deterred Orillia from having it in their system years ago? A: We're not sure of the process or decisions that were made at that time. Q: How much per household will it cost? A: Less than $1.00 per person per year. Q: Will it go on our water bill? A: Yes. Comment from the floor: Children in Toronto have better teeth because of CWF, but that's not the case in Orillia. Q: Do they still have dental programs in the schools? A: Yes, the health unit provides dental screening in the schools by dental hygienists.	16 group members attended

Q: Do you put chlorine in the water system?
A: Yes, it's put into the water system to make the water safe. Chlorine is the most effective chemical we've got to prevent waterborne disease.

Q: You say we're still going into the schools. I know Hillcrest PS has never seen a dentist in that school.
A: Yes, I agree that there are fairness issues when the health unit doesn't go into all the schools. We go into the schools where there are more children of low income families. That's why CWF is such a good initiative as it will act as an equalizer for children from families of all income levels.

Comment from the floor: I can't drink the water here because I gag on it. It's like swamp water.

Q: Is there a dentist that goes into the schools like there used to be years ago?
A: The health unit has dental hygienists that go into the schools to do the screening. We will then refer children to a dentist if there is a need for further dental care. The health unit also has a mobile dental bus that travels from place to place in Simcoe Muskoka. This service is especially for children 17 years and under from low income families.

Q: When we went to school we used to be checked by a dentist two times a year. Do you do that anymore?
A: No, we don't. We have to work within our resource limitations. But one good trend we're seeing over the last few years is the overall decrease in dental decay rates.

Comment from the floor: My husband is 90 and he has all his own teeth.

Q: Isn't fluoridated toothpaste helping the decay rates?
A: Yes it helps, but dental outcomes are still much better when both fluoridated toothpaste and CWF are combined. Both interventions are best.

Comment from the floor: Some toothpastes are very expensive.

Q: The health unit needs to be fair and go into every school to screen the children. Why don't you do this?
A: I will raise it with my staff. But I want to repeat that having CWF would provide the prevention needed for children and it would be much more effective for a lot less money.

CWF Public Presentation Recording Sheet

Group:	Orillia media
Date:	Monday, 23 January 2012
Time:	10 a.m. – 11 a.m.
Location:	SMDHU Orillia Office (Common Roof)
Presenter:	Jason Covey (City of Orillia – Engineer Public Works) and Dr. Charles Gardner (SMDHU – Medical Officer of Health)
Recorder:	Megan Williams (SMDHU)

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
Jason and Dr. Gardner were introduced. Jason provided a 10 minute overview of how fluoride is added to the community water system. He also described Orillia's public consultation process on community water fluoridation (CWF). Dr. Gardner delivered a 20 minute presentation about CWF, including: the need for CWF in Orillia; its safety, effectiveness and dental health benefits; the research and evidence supporting CWF; and its history. A question and answer period followed the presentations, with answers from Dr. Gardner (and others as noted). Q: Do you expect the 24% of Orillia residents who stated they oppose fluoridation will mount an opposition campaign? A: Yes, I do expect it to happen. But it won't just come from people locally. The anti-fluoride groups are very well organized so they will probably come from areas outside of Orillia as well. Q: The fact that council has raised this issue must be a check point for the health unit. A: The fact that council is raising it is endorsing that they want to hear from the community about it. It still needs to be approved by Council. Q: How much will CWF cost? A: (from Peter) The equipment will cost between $50,000 and $100,000 and then it will cost about $25,000 annually to run it. There may be some set up costs as well. Q: That seems awfully cheap. A: It's fairly small equipment and is easy to fit into our water plants. This breakdown of costs is supported by what other communities have paid for their systems. Q: I've seen a letter from Hardy Limeback (dentist and professor at University of Toronto's School of Dentistry). Are you aware of him? A: (from Dr. Gardner) Yes, we're aware of him. There is a range of opinions in the health profession about fluoridation. His views don't represent the	Four media organizations were in attendance: Jim Birchard – Sunshine FM Miranda Minassian – Packet and Times Frank Matys – Orillia Today Amanda Groulx – Rogers Television From SMDHU: John Challis Dr. Dick Ito Ted Devine From City of Orillia: Peter Dance

School of Dentistry at the University of Toronto or the views of his profession in general.

Q: The average person listening to Dr. Limeback might get scared about fluoridation.

A: It's easy to raise a concern about something and not to support it with data and research. It's often harder to try to dispel a concern when it's planted in people's heads, even if you have the research and data to support it.

Q: Do you feel confident in telling the public that CWF is safe (question posed to Dr. Dick Ito)?

A: (Dr. Ito) Yes.

Q: What are you talking about when you say Orillia has the worst dental decay rates in Simcoe Muskoka?

A: We're talking about 1.5 more cavities per child. This is quite a cost impact on a community.

Q: Who are we trying to help in Orillia with CWF? What kinds of problems do you see in kids? What's the picture?

A: The prevalence of tooth decay is 55% of kids have some range of decay in Orillia. Severe decay in 25% of the population. That's 5-9 decayed teeth in those children. Under the CINOT program a significant number of cases are kids aged 4-6 years old. A number of them require a general anaesthetic (GA) to undergo the treatment required because there are so many cavities. A general anaesthetic is undesirable due to the potential for complications.

Q: How unusual is it for 4-6 year olds to go through something that severe?

A: If you have 1-2 cavities you don't need to go under a GA. A small group of kids who have a lot of cavities are usually under the special care of a paediatric dentist.

Q: People want to put a human face to this. They need to understand who and how people are being affected by tooth decay. You should include this in your presentation.

A: (from Peter) That's what the February 29th meeting is about, for people to tell us their stories - good, bad or indifferent. We need to gather the information and give it all back to council in a report so they can make a decision.

Q: Who is the health unit's action sheet for individuals distributed to?

A: To our clients and people that health unit staff interact with on a daily basis, as appropriate. It's also available on our website.

Q: Is that because the opposition is louder?

A: It's so that we can educate people about CWF.

Q: What's your comment to people in response to claims and concerns raised by people like Dr. Limeback?

A: We have a role to promote the health of the population in Simcoe Muskoka. From all the comprehensive literature and research done into CWF we are advocating that people become informed. They can visit our website to get good credible information. Those who are opposed to CWF tend to cherry-pick their information and misinterpret the results of specific studies, and show them in isolation of other evidence. Often the study design of a particular study they quote is methodologically flawed. Q: Do the benefits of CWF outweigh the risks that are posed in the selected studies? A: You can come to a biased conclusion if you only consider the selected reviews of studies the opposition has pointed to. You need to look at the whole body of research to see that the benefits far outweigh the risks of CWF. This issue has been studied for 60 years and has a large and solid body of evidence to support it.	

CWF Public Presentation Recording Sheet

Group:	Muskoka Simcoe Dental Society
Date:	25 January 2012
Time:	7:00 – 7:30 p.m.
Location:	Highwayman Inn, Orillia
Presenter:	Dr. Charles Gardner (SMDHU)
Recorder:	Jason Covey

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
Dick Ito introduced Dr. Gardner. Dr. Gardner delivered a 20 minute presentation about CWF including: details about the City's public consultation process; an overview of public health and the Simcoe Muskoka District Health Unit; the need for CWF in Orillia; the safety, effectiveness, and dental health benefits of CWF; the research and evidence supporting CWF including, detailed statistical evidence; the cost effectiveness of CWF; and the history and nature of opposing viewpoints to CWF. An opportunity for questions and comments was provided, but none were forthcoming.	32 society members in attendance

CWF Public Presentation Recording Sheet

Group:	Orillia Soldiers' Memorial Hospital Grand Rounds
Date:	February 3, 2012
Time:	12:00 – 1:30 p.m.
Location:	Dr. Brian McGougan Room, Orillia Soldiers' Memorial Hospital, Orillia
Presenter:	Dr. Charles Gardner and Dr. Dick Ito (SMDHU)
Recorder:	Jason Covey

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
Dr. Gardner, Dr. Ito, and City of Orillia representatives were introduced. Dr. Gardner spoke first for about 20 minutes covering topics that included: · Case study of a CINOT patient from the Orillia area · The need for CWF in Orillia · Details about the City's public consultation process · The history and nature of opposing viewpoints to CWF, and the history of the CWF debate in Orillia · An overview of public health and the Simcoe Muskoka District Health Unit · The safety, effectiveness, and dental health benefits of CWF · The research and evidence supporting CWF, including detailed statistical evidence from local, provincial, national, and international regions Dr. Ito spoke for about 10 minutes on topics that included: · The results of systematic research reviews · Simcoe Muskoka screening data · Regional and provincial comparisons illustrating the effectiveness of CWF · The benefits of CWF to adults in Canada Dr. Gardner then spoke for another 10 minutes on topics such as: · The safety of CWF, including a systematic review that discounts links between CWF and cancer · The cost effectiveness of CWF · Local and regional support for CWF A question and answer period followed the presentations: Q: There appears to be lots of evidence to support the implementation of CWF. What criteria will the City use to make this decision? A: Public Works will prepare a report to council, in which we suspect that we will recommend the implementation of CWF. Ultimately the decision will be made by council and will be based on a judgement of whether or not the citizens of Orillia feel that this is a good decision. Q: You have demonstrated the safety of human health. What about the environmental effects of CWF? A: Fluoride is naturally found in Orillia's water at a level of 0.2 mg/L. Generally speaking, the added amount from CWF will be negligible. However, this is a question that we will seek to address in more detail.	Approximately 50 people in attendance From City of Orillia: Peter Dance

Q: In the comparisons that you have made between local communities, how have you controlled for socio-economic factors?

A: The communities were chosen to match these factors as closely as possible. The full data set is available for anyone to see.

Q: Is it not true that because your data on school children was collected with a higher level of screening, you will automatically see a higher level of decay in the results?

A: No. Previous studies were conducted with a representative sample. There are limitations to statistics in general. However, it is important to note that we are not just relying on local data. Overall, the body of research suggests beneficial results of CWF, including in adults.

Q: What is the level of fluoride in bottled water or water that has gone through Reverse Osmosis?

A: Fluoride levels in bottled water are generally low – labels on the bottles usually indicate the amount of fluoride. Food will also have some fluoride content. There will be some individuals who may choose to opt out of CWF, but we are looking at the big picture, the benefits to the community as a whole.

Q: The Dialysis Unit uses Reverse Osmosis to purify water to European Standards. The introduction of CWF may result in the need for more quality control. Have you consider the effect of CWF on vulnerable populations.

A: Health Canada's review has considered these vulnerable populations. Germany does not use CWF but adds fluoride to its salt. The philosophy is the same, but there is much more research available for CWF.

CWF Public Presentation Recording Sheet

Group:	Orillia Chamber of Commerce
Date:	28 February 2012
Time:	8 a.m.
Location:	Best Western Mariposa Inn, Orillia
Presenter:	Dr. Charles Gardner (SMDHU), Jason Covey (City of Orillia Public Works)
Recorder:	Megan Williams (SMDHU)

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
Jason and Dr. Gardner were introduced. Jason provided a 5 minute overview of Orillia's public consultation process on community water fluoridation (CWF). Dr. Gardner delivered a 15 minute presentation about CWF, including: the need for CWF in Orillia; its safety, effectiveness and dental health benefits; the research and evidence supporting CWF. A question and answer period followed the presentations. Q: Speaking from my Council (Councillor Tony Madden) perspective this is an overwhelming issue and I don't know what the answer is. It's very contentious. Thank you for coming. What is driving the opposition side to this issue to lobby and advocate against it? A: I don't have the answer to that one. I think you'd have to ask the opposition that question. My own take is from my reading a lot about this issue. In part it's the rights issue. People see that CWF is imposed on them and they can't get away from it. You can get rid of fluoride in water but it will cost you. But CWF is a collective solution and public health has done collective solutions before e.g. Vitamin D in milk, chlorine in water, etc. We think in terms of the common good and so we advise them of the good. There are many opponents of collective solutions and you'll always get into a debate against individual rights vs. collective solutions. Q: Why did it take 50 years to revisit this and why are big cities taking it out of their water systems? A: We put out a report in 2009 about oral health status. Joe Fecht brought it to Council to bring it up as a consideration. Why are cities removing it? Most cities are actually keeping it. Only a few are taking it out. Comment: The challenge of the healthcare system is that we must do more health promotion and illness prevention. You save money with this approach. Municipalities have to pick up the cost of CWF but it saves money in the long run to the healthcare system. Q: How deep is your comparison between St. Thomas and Orillia? A: We looked at different socio-economic and demographic variables such as population, percentage of low income families, etc. to see what the differences were in the indicators. Based on those indicators we found St. Thomas to be closely matched to Orillia, although not as close a match as	17 Chamber of Commerce members in attendance Bill Mindell, Director of Clinical Service, SMDHU (observer)

found in formal systematic reviews. Comment: People want to hear the truth. People have lost confidence in government. Q: How long has St. Thomas been fluoridated? What about comparison between St. Thomas and Orillia on the demographic factors and perceived health risks, e.g. cancer? A: We've only done a fluorosis comparative, which are pretty much the same in both cities. We haven't looked at other health risks. I'd be concerned with the results of getting into these with the very small population numbers and such rare occurrences of some of these risks. Q: Is the risk of fluorosis still a concern for those people who do the right dental hygiene and dental behaviours? A: The Health Canada review concludes at .7 ppm the range is safe.	

CWF Public Presentation Recording Sheet

Group:	Orillia Chapter Simcoe County Alliance to End Homelessness
Date:	Feb 14 2012
Time:	2 pm – 2:45pm
Location:	Orillia City Hall: Tudhope-McIntyre Room
Presenter:	Dr. Charles Gardner (Medical Officer of Health, SMDHU) & Jason Covey (Engineer, City of Orillia)
Recorder:	Donna Taylor

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
The Chair, Joyce Ward, welcomed all and introduced the guests and participants. Jason Covey provided an introduction and overview about Community Water Fluoridation, the consultation process and objectives. Dr Gardner spoke for about 30 minutes and provided the group with: · information about the role of the HU in both general terms and specific to the promotion of oral health · the history of CWF in the province and Orillia · why CWF is important and how it impacts oral health in all age groups · local data about rates of decay · a description of the science that supports the safety of CWF · a summary list of provincial national and international groups who support CWF · an explanation of the benefits and relative low costs of implementing the addition of fluoride to the community's water · an overview of the challenges faced in relation to opposition · encouragement to promote the acceptance of CWF as citizens and with clients in the community and to participate in public discussions and other opportunities to voice support Literature was highlighted and left for distribution, including Fact Sheets, Action sheets for Organizations and a few of the Action Packs for Community Partners Questions were asked both during the presentation and at the end. The Q and As are summarized here. Q. What is the ideal mechanism for receiving fluoride? In the water or in a varnish? A. Fluoride can be applied in a varnish or in toothpaste **and** it can be delivered in the drinking water. Having fluoride delivered in these ways together is ideal. Fluoride can also be purchased and taken as a supplement, but this is not advised as the best way to receive fluoride because too much may cause Fluorosis, a discolouration of the teeth and it is easy to miss doses, and then not get enough. Q What are some of the reasons people oppose fluoridation? A. Dr Gardner moved to this portion of the presentation and talked about the history of opposition and about the facts that those opposed allege, such as the belief that fluoride causes cancer, skeletal effects and other diseases. He also spoke of oppositional views related to environmental concerns, and	14 people attended the session; the following agencies were represented: Orillia Youth Center, Couchiching Jubilee House, Ontario Healthy Communities Coalition, Simcoe Community Services, Ontario Works, Green Haven Shelter, Salvation Army and staff and students from Georgian College Community Placement Initiative Also in Attendance: Donna Taylor, PHN, SMDHU

social libertarian issues around individual rights vs the common good. Dr G also gave an overview of the Anti –Fluoridation Network and the role they play. Q.If Fluoride is added to the water in the community and used by the most vulnerable people, and if they made no other change, such as brushing or dental care or nutrition, would we see a difference in their oral health? A. Yes, especially if they are at the high end of dental disease. Dental care and other behaviours are important, but the addition of fluoridated drinking water would result in a substantial improvement. Q. How far back do studies go to look at the overall effect on health from having community water fluoridation? A. We have studies that date back to the 70s. For example, studies have looked at osteogenic sarcoma, a cancer of the bones, to see if fluoride, which can be measured in the bones, is present. These studies showed no relationship between cancer and water fluoridation. Many studies have been done; in fact there is a very rich body of evidence looking at a variety of health effects that has found no identified risk to health from fluoridation of drinking water. Q. What about longitudinal studies? A. This kind of research is not as common as it is very time intensive and expensive. Most of the evidence we have is from research that has looked back. Q. Does the strongest opposition come from people who live near lakes? How big is the opposition related to environmental impacts? A. Environmental issues and impact will be looked at further. There is a representative from the Ministry of the Environment presenting at the Feb. 29th public meeting. Wastewater treatment may reduce the concentration. There is also further dilution that occurs that results in the amount of fluoride present in lakes and streams to be so small as to be insignificant. Q. Why did Waterloo region stop their CWF program? A. The council there was challenged by the anti-fluoridation group. Additionally, the structure of the regional system there resulted in the HU taking no role in the process, so health benefits were not strongly presented. The decision was put to a plebiscite; those in opposition had a much stronger voice than those in support. The result was a decision by council that was perceived to be a safe one. Q. Will there be a plebiscite here? How will the decision be made? A. The public consultation process includes the preparation of a report of all the information collected which will be presented to council this spring. Decision making will follow. Q. I live in Penetang. Is my water fluoridated? A. There may be some naturally occurring fluoride in the water, but that community does not add fluoride to its drinking water.	

CWF Public Presentation Recording Sheet

Group:	Orillia Rotary Club
Date:	10 April 2012
Time:	12:45 p.m.
Location:	Highway Man Inn, Orillia
Presenter:	Dr. Charles Gardner (SMDHU), Jason Covey (City of Orillia Public Works)
Recorder:	Megan Williams (SMDHU)

Presentation Proceedings	**Notes** (include # of people attending and other pertinent information)
Jason and Dr. Gardner were introduced. Jason provided a 10 minute overview of Orillia's public consultation process on community water fluoridation (CWF). Dr. Gardner delivered a 20 minute presentation about CWF, including: the need for CWF in Orillia; its safety, effectiveness and dental health benefits; the research and evidence supporting CWF. A question and answer period followed the presentations. Q: Wasn't the water in Orillia fluoridated in the past? A. There was a decision by Council to fluoridate in the 1960's but it was overturned by a plebiscite so it did not go ahead. Q: What are the concerns of people opposed to CWF? A: There are several concerns, including: · Health concerns – We need to look at all the evidence to see where it comes from and to make a decision based on ALL the evidence. · Hazardous chemical to handle, but we can address that by taking proper precautions. · Ethical concerns – mass medication, etc. Q: What are the pros and cons of CWF at this point for Orillia? A: I can speak to the health issues. The pro is that this is an opportunity to improve the dental health of the residents of Orillia. As for the con, we are looking at all of the concerns raised to see if there is any merit to them. We have addressed each of those concerns. Q: How do you compare the addition of chlorine to water with adding fluoride to water? A: Chlorine is very beneficial and has a much bigger impact in terms of the overall protective health benefit to people. Q: I work in mental health and am appalled at the rate of tooth decay. Why can't we just use fluoride drops instead of adding it to the water? A: Fluoride drops is an individual solution. Even if you have good oral health there's still a residual positive effect of water fluoridation. The Ontario Dental	28 Rotary members in attendance Dr. Sue Surry AMOH, SMDHU (observer) and Dr. Kristina Lyte, Medical Resident, SMDHU (observer)

Association is concerned about fluoride drops for people because you can overdose and the result could be fluorosis. CWF is more likely to get to those who do not have good oral health behaviour. Q: Chloride corrodes the taps. By going to reverse osmosis system, would we still need fluoride in the water? Is it worth the expense for the City to do this? A: Reverse osmosis is a nano-filtration to target the removal of specific ions. I'm not sure how much it would remove fluoride ions. There's not really an application for it in Orillia. Q: The equipment used for fluoride – has it ever failed? A: We would have a control system in place that would shut down the line if something happens. In the past 5 years there have been no incidents in Ontario of a fluoride equipment failure. Comment: I trust the professionals in this situation. I remember the number of goiters before iodine was put in the salt. You never see that now. That's why I believe in the health unit's advice on the fluoride issue. Q: Cost wise, who pays the $38.00? Who's saving the money, the City or the County? A: Cost savings are both public and private costs related to dental treatment. Q: Has anyone ever advocated to the province for universal dental care? A: Yes, but it's never come to pass in Ontario.	

APPENDIX D

FIRST PUBLIC FORUM MATERIAL

CITY OF ORILLIA

FLUORIDATION PUBLIC FORUM

Wednesday, February 29, 2012, 6:30 to 10:30 pm
Council Chamber, First Floor, City Centre, 50 Andrew St. S

Program

I. Information Tables 6:30 to 6:55 pm
II. Call to order 6:55 pm
III. Formal Meeting 7:00 to 9:50 pm
  a. Introductory Presentations 7:00 to 7:30 pm
    i. City presentation – Peter Dance
    ii. City presentation – Jason Covey
    iii. SMDHU presentation – Dr. Charles Gardner
    iv. Health Canada presentation – Dr. Peter Cooney
  b. Registered Presentations 7:30 to 9:20 pm

i. Peter Van Caulart – Canadians Opposed to Fluoridation
ii. Colleen O'Neill (Raging Grannies) – Fluoridation of Drinking Water
iii. Tammy Gouweloos – Fluoridation of Orillia Drinking Water
iv. Scott Miller – Health effects of fluoride
v. Dick Ito – Safety and effectiveness of Community Water Fluoridation
vi. Alice den Otter and John Brown – Alternative options to fluoridation
vii. Keith Morley – Value of fluoride to maintain oral health care for children
viii. Tim Fletcher – Environmental impact of fluoridated municipal wastewater
ix. Dianne Orton – Dangers of Fluoridation
x. Henry Wilson – Advantages of a Fluoridated Water Supply

  c. Comments from the floor 9:20 to 9:50 pm
IV. Adjournment 9:50 pm
V. Informal Discussion 9:50 to 10:20 pm
VI. Doors Close 10:30 pm

CITY OF ORILLIA

PUBLIC CONSULTATION ON FLUORIDATION

The City's public consultation on fluoridation of drinking water is being conducted with the assistance of the Simcoe Muskoka District Health Unit. The public consultation process is being carried out with the following schedule:

Feb 29, 2012	First Public Forum – Information gathering
Mar 30, 2012	Deadline for comments, questions, and concerns to be submitted for consideration
May 29, 2012	Second Public Forum – Reporting back Presentation of findings and recommendations Receipt of questions and comments from the public
June 2012	Present recommendation report to Council

simcoe muskoka
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MEMO

TO: Peter Dance, Director of Public Works, City of Orillia
Jason Covey, Engineer, Public Works, City of Orillia

FROM: Simcoe Muskoka District Health Unit

DATE: March 30, 2012

RE: New information regarding questions arising at the February 29th, 2012 public meeting on Community Water Fluoridation

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Several questions and comments arose at the above mentioned meeting that pertain to new information that has not already been submitted or presented by the Simcoe Muskoka District Health Unit (SMDHU) over the course of the public consultation process. Answers to the questions are below. These answers have been provided by Dr. Peter Cooney, Chief Dental Officer, Health Canada, via: email to Dr. Dick Ito, Dental Consultant for SMDHU, on 20 March, 2012.

Q1: Who selected and appointed the panel? [NOTE: This question refers to the panel appointed to provide expert advice about fluoride in drinking water (Findings and Recommendations of the Fluoride Expert Panel - 2007) and to make recommendations to Health Canada and the Federal-Provincial-Territorial Committee on Drinking Water (CDW).]

A: Health Canada's Water, Air and Climate Change Bureau selected experts based on the expertise that was needed to complement the in-house expertise. The panel was selected by Health Canada to make recommendations to the department specifically concerning dental health.

Q2: Why were there four pro-fluoride dentists out of six panel members?

A: The experts were selected based on their specific expertise, and not on their position regarding water fluoridation. Health Canada Expert Panel members included:

- **Steven M. Levy**, Iowa College of Dentistry Wright-Bush-Shreves Endowed Professor of Research, Department of Prosthodontics
  Education:
  DDS, University of North Carolina, 1982
  MPH, University of North Carolina, 1984
  Certificate, Dental Public Health, North Carolina Department of Human Resources, 1984
  Diplomate, American Board of Dental Public Health

- **Christopher Clark**, DDS, MPH
  University of British Columbia, Dentistry professor emeritus

- **Robert Tardif**, Université de Montreal
  Titre de fonction: Professeur associé
  Professeur titulaire (retraité)
  Formation :

M.Sc. Pharmacologie (Montréal, Université de Montréal)
Ph.D. Santé communautaire, option Toxicologie de l'environnement (Montréal, Université de Montréal)

- **Michael Levy**, DMD, MPH (Environmental Health)
  Dental Consultant, Direction du développement des individus et des communautés (Individual and community development department)
  Institut national de santé publique du Québec (Quebec public health institute)

- **Jayanth Kumar**, New York State Department of Health
  Dr. Jayanth Kumar is the director of Oral Health Surveillance and Research for the New York State Department of Health. He has authored or co-authored more than 35 research papers on oral health and he served on the National Research Council's Committee on Fluoride in Drinking Water, which released its report in 2006. Dr. Kumar has served as a research consultant to the Centers for Disease Control and Prevention, the National Institute of Dental & Craniofacial Research, and other organizations.

- **Albert Nantel**, Institut National de Santé Publique du Québec
  Director, Toxicology, Health and Environmental Group, Centre hospitalier universitaire de Quebec (CHUQ)
  Dr. Albert Nantel received a degree in medicine from the University of Montreal in 1964. He then completed a Master's Degree in pharmacology at the university's Faculty of Medicine in 1966. He was a cardiology research fellow at Notre-Dame de Montréal Hospital in 1967, then a clinical pharmacology research fellow at Emory University in Atlanta, Georgia. He completed a year as a research fellow at McGill University in Montreal in 1968. From 1968 to 1972, he was an assistant professor of pharmacology and medicine at the University of Sherbrooke's Faculty of Medicine before moving on to head up the Regional Toxicology Center at the Centre hospitalier de l'Université Laval (CHUL) in 1972. In 1975, the center became the Quebec Center for Toxicology (Centre de toxicologie du Québec). The same year he was certified by the American Board of Medical Toxicology. From 1980 to 1982, he was director of the Department of Pharmacology of Laval University's Faculty of Medicine. He headed up the Clinical Pharmacology and Toxicology Unit of CHUL's Department of Medicine from 1972 to 1999. He has been a consultant at the Quebec Anti-Poison Center since its creation in 1988. Since his departure from the Quebec Toxicology Center in 2000, he is a medical adviser for the Institut national de santé publique du Québec (INSPQ).

Q3: Regarding lowering of IQ – why were only five studies reviewed when 23 were available at the time?

A:The process for developing a *Guideline for Canadian Drinking Water Quality* requires the examination of numerous studies, through a comprehensive research of the scientific literature. The guidelines are based on original relevant scientific studies that are published in internationally recognized peer-reviewed journals. Studies that are not found to meet scientifically-accepted quality criteria are not included in the Health Canada final assessment. The majority of available studies regarding an association between fluoride and lowered intelligence have not been found to meet the required quality criteria, which means that they cannot be considered as part of the Health Canada risk assessment.

Q4: Why were the 18 studies, which were submitted after the draft was available for comment, not reviewed in the final report?

A: See response to Question 3.

Q5: More and more cities are removing fluoride from their water. People are speaking out and they don't want it in their water. Who is taking it out and is anybody putting it in?

A: In the past few years, three communities in Quebec have voted to either introduce or re-introduce fluoridation to their municipal water supply. These include:

1. **Trois-Rivieres** – February 2012 – see following link (in French):
   http://www.cyberpresse.ca/le-nouvelliste/vie-regionale/trois-rivieres/201202/21/01-4498090-oui-a-la-fluoration-de-leau.php

2. **Mont-Joli** - 2011

3. **Dorval** – 2008 – see following links (in English):
   http://www.inspq.qc.ca/pdf/publications/705-WaterFluoration.pdf
   Levy M, Corbeil F. Water Fluoridation: An Analysis of the Health Benefits and Risks. Institut national de santé publique du Quebec. June 2007, Pg 5

   "Data collected on the children enrolled in public schools in Dorval between 2003 and 2006 indicate that the percentage of kindergarten children at high risk of developing dental doubled in the two-year period after water fluoridation was halted in 2003, rising from 8% to 17%, which represents a statistically significant difference (25). Although the data present certain methodological limitations, they were corroborated in independent modeling studies conducted by the INSPQ (25)."

   25. Levy, M. Update on Water Fluoridation in Quebec (French). 9th Quebec Public Health Meeting, June 2007

Across Ontario and the rest of Canada, a number of municipalities have faced recent challenges to community water fluoridation. Below is a status report of those municipalities:

STATUS OF CHALLENGES TO COMMUNITY WATER FLUORIDATION (CWF) IN CANADA SINCE 2008

Ontario Municipalities Maintaining CWF

Halton Region	Voted to maintain CWF January 12, 2012
Peel Board of Health (B of H)	Voted to maintain CWF April 28, 2011
Hamilton B of H	Voted to maintain CWF April 26, 2011
Muskoka District Council	Voted to maintain CWF April 26, 2011
Toronto B of H	Voted to maintain CWF April 4, 2011
London B of H	Voted to maintain CWF Feb 17, 2011
Tottenham	Council voted maintain CWF April 27, 2009
Norfolk County	Council voted maintain CWF March 24, 2009
Atikokan	Council voted to maintain CWF Nov. 10, 2008

Canadian Municipalities Maintaining or Resuming CWF

Trois Rivieres, PQ	Voted to resume CWF February 21, 2012
Fort St. John, BC	Voted 1,510 to 1,102 to maintain CWF November 19, 2011
Hinton, AB	Voted to maintain CWF November 15, 2011
Mount Joli, PQ	Voted to resume CWF November 2011
Whitecourt, AB	Voted to maintain CWF October 18, 2011
Churchill, MB	Continues to fluoridate after plebiscite October 19, 2011 voted 92 to 67 (28% electorate) against CWF
CBRM - NS	Voted to maintain CWF April 19, 2011
Lethbridge, AB	Voted to maintain CWF April 18, 2011
Dorval, PQ	Resumed CWF August 21, 2008

Ontario Municipalities that Ceased or Did Not Start CWF

Amherstburg	Council voted to stop CWF February 7, 2012
Lakeshore	Council voted to stop CWF October 31, 2011
City Waterloo	Referendum difference of 195 votes out of 30,727 cast, to stop CWF Oct 25, 2010
Thunder Bay	Council voted not to start CWF July 20, 2009
Dryden	CWF defeated in referendum April 14, 2008
Niagara Region	Council voted not to restart CWF Jan. 24, 2008

Canadian Municipalities that Ceased CWF

Moncton, NB	December 19, 2011
Dieppe, NB	December 12, 2011
Lake Cowichan, BC	November 19, 2011
Williams Lake, BC	November 19, 2011
Grimshaw, AB	April 13, 2011
Slave Lake, AB	September 12, 2011
Taber, AB	July 20, 2011
Meadow Lake, SK	July 4, 2011
Flin Flon, MB	July, 2011
Calgary, AB	February 8, 2011
Vercheres, PQ	February 7, 2011

Petitions to the Auditor General of Canada re: Fluoridation
Gov. of Canada response to Nov. 19, 2007 petition (221) to discontinue fluoridation - 11 petitions to date

Office of the Auditor General of Canada, Petitions by Petition Number
http://www.oag-bvg.gc.ca/internet/English/pet_lp_e_938.html

Petition No.	Date Filed	Response
221	Nov 19, 2007	**Yes**
221B	April 7, 2008	**Yes**
221C	April 14, 2008	**Yes**
221D	April 14, 2008	**Yes**
221E	Nov 25, 2009	**Yes**
243	April 17, 2008	**Yes**
244	April 18, 2008	**Yes**
245	May 2, 2008	**Yes**
299	May 19, 2010	**Yes**
299B	Nov 23, 2010	**No**
299C	Dec 20, 2010	**Yes**

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TO: Peter Dance, Director of Public Works, City of Orillia
Jason Covey, Engineer, Public Works, City of Orillia

FROM: Simcoe Muskoka District Health Unit

DATE: April 20, 2012

RE: Health Unit responses to issues arising at the February 29th, 2012 public meeting on Community Water Fluoridation

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Several issues related to community water fluoridation arose from the presentations made at the above mentioned meeting that require a response by the Simcoe Muskoka District Health Unit (SMDHU). The issues and their responses are below.

ISSUE/CONCERN	HEALTH UNIT RESPONSE	REFERENCES
1. Fluoride is an acid and it will create issues similar to the acid rain problem in Sudbury. What are the environmental long-term effects of this compound?	Fluoride itself is not an acid. One of the most frequently used chemicals in water fluoridation is fluorosilicic acid. When it combines with water to achieve the concentration of 0.5 to 0.8 parts per million (as required by the Ontario Safe Drinking Water Act), this acid breaks down into harmless components, including the fluoride ion. The free-floating fluoride ion is what is measured in parts per million in drinking water. The concentrations of fluoride in drinking water are so low that when treated wastewater is flushed into lakes it dilutes to an almost undetectable level. The main human source of fluoride in water is generated by the aluminum smelting industry (1). The European report, "Critical Review of any New Evidence on the Hazard Profile, Health Effects, and Human Exposure to Fluoride and the Fluoridating Agents of Drinking Water, 18 May 2010", by the Scientific Committee on Health and Environmental Risks (SCHER), states the following about the form of fluoride in drinking water: "In the pH-range and at the concentrations of hexafluorosilicates/fluoride relevant for drinking water, hydrolysis of hexafluorosilicates to fluoride was rapid and the release of fluoride ion was	1. NRC, National Research Council Committee on Fluoride in Drinking Water (2006). "Fluoride in the Drinking Water: A Scientific Review of EPA's Standards (Pre-publication). http://www.nap.edu/catalog/11571.html#toc. 2. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile,

ISSUE/CONCERN	HEALTH UNIT RESPONSE	REFERENCES
	essentially complete, and residual fluorosilicate intermediates were not observed by sensitive (methods)." (2)	health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011. http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf
2. A spill of fluoride during transportation would be a catastrophe for Orillia. It's a hazardous waste issue.	The City of Orillia, like all municipalities in Ontario, is bound by legislation to follow strict handling protocols for all hazardous chemicals. The chemical for community water fluoridation falls under that legislation as well. Health Canada states: "Fluoridation additives certified for use in drinking water are not classified as hazardous waste in Canada." (1) According to Environment Canada, when transported in its concentrated form, hydrofluorosilicic acid is "identified as a dangerous good under the *Transportation of Dangerous Goods Regulations* and has been classified as a Class 8 corrosive substance" (1). The Canadian federal transportation regulations can be viewed here: http://www.tc.gc.ca/tdg/clear/tofc.htm It is important to remember that many hazardous materials are transported continuously through communities by air, rail, and on roads and highways following these protocols. In the rare event an accident occurs with any substance, there are trained, equipped and qualified agencies and services using established Hazmat procedures to isolate, control and clean-up any hazardous spills that may occur.	1. Joint Government of Canada Response to Environmental Petition No. 221 filed under Section 22 of the Auditor General Act. Received November 19, 2007. Petition to Discontinue Water Fluoridation March 18, 2008, p.2.
3. Dangerous chemicals such as lead and arsenic are associated with fluoride that is added to our water.	"Health Canada strongly recommends that all products added to drinking water during its treatment and distribution be certified as meeting the appropriate NSF standard(s). This is true for all additives used for fluoridation, and means that any impurity in the additive is below levels that could pose a risk to human health. Water properly treated with these certified additives would present no health risk to the consumer from either the fluoride or any impurity." "NSF Standards are voluntary standards, which can be referenced in legislation or	1. Joint Government of Canada Response to Environmental Petition No. 221 filed under Section 22 of the Auditor General Act. Received November 19, 2007. Petition to Discontinue Water Fluoridation March 18, 2008, p.4.

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	regulation to make them enforceable. Products are certified as meeting a specific standard. An additive that does not meet the requirements of standard 60 cannot be certified." "The standard requires a toxicology review to determine that the product is safe at its maximum use level and to evaluate potential contaminants in the product, such as those mentioned. NSF International carried out tests of fluoridation additives using 10 times the maximum use level of the additive in water. The concentration of contaminants was compared to the single product acceptable concentration (SPAC), which is 10% of the Canadian guideline or the U.S. EPA Maximum Contaminant Level (based on a harmonized list of values). Limiting individual products to a contribution of 10% of the MCL for a given contaminant provides an extra margin of safety so that it is unlikely that the summation of the contributions from all potential sources will exceed the MCL at the tap. All contaminant levels, even when tested at 10 times the maximum use level, were well below the SPAC. Details on the results can be found on the NSF International website, at http://www.nsf.org/business/water_distribution/pdf/NSF_Fact_Sheet.pdf"	
4. We shouldn't be adding toxic waste to our water.	At levels up to the maximum acceptable concentration, fluoride in drinking water is not toxic. The possibility of adverse health effects from continuous low level consumption of fluoride over long periods has been studied extensively. After more than 60 years of research, scientific evidence indicates that fluoridation of community water supplies is both safe and effective. Any municipal water supply in Ontario undergoes extensive, transparent review and continuous monitoring by the Ministry of Environment. The Ministry does not allow "toxic substances" in our drinking water (1).	1. Health Canada (2010) Guidelines for Canadian Drinking Water Quality Guideline Technical Document – Fluoride. Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
5. Fluoride is poisonous, toxic and corrosive and shouldn't be ingested by	Fluoride is the ionized form of the element fluorine. Fluorine is the 13th most abundant element in the earth's crust (1). Fluoride is naturally found in varying concentrations throughout the environment; in the water (surface or below ground), in ambient air and in the soil. In Canada, water from lakes or from wells contains < 0.05 to 4.4 parts per million (ppm) fluoride. Soils contain a mean concentration of	1. Health Canada (2010) Guidelines for Canadian Drinking Water Quality Guideline Technical Document – Fluoride. Water, Air and

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people.	309 ppm (ranging from 50 to 1000 ppm); and by breathing, Canadians inhale an estimated 0.01 micrograms/kg body weight (bw) per day of fluoride (1). Sea water contains 1.2 to 1.4 ppm fluoride (2). Due to its ubiquitous presence, dietary fluoride intake from foods prepared even in non-optimally fluoridated communities ranges from 0.024 to 0.033 mg/kg bw/day. Fluoride is present in all plants and animals (3). Fluoride is ingested by people continuously whether or not their drinking water contains optimal levels of fluoride. At or below the maximum allowable concentration of 1.5 ppm, fluoride is not poisonous, toxic or corrosive.	Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. 2. Whitford, GM. The metabolism and toxicology of fluoride. Monogr Oral Sci 1989; 13: 1-160. 3. Burt BA, Eklund SA. Dentistry, Dental Practice, and the Community, 6th ed. 2005 Elsevier Saunders.
6. Fluoride can be absorbed by bathing and showering in fluoridated water and it is a hazard.	The United States Agency for Toxic Substances and Disease Registry Report, "Toxicological Profile for Fluorides, Hydrogen Fluoride and Fluorine, September 2003" states: "Therefore, most of the information for the inhalation and dermal routes comes from studies of acute exposure to fluorine (gas) or hydrofluoric acid." (1) There is no indication in the report that dermal absorption of fluoride ions occurs upon contact with optimally fluoridated water. Additionally, the Scientific Committee on Health and Environmental Risks (SCHER) states: "As fluoride is an ion it is thus expected to have low membrane permeability and limited absorption through the skin from dilute aqueous solutions at near neutral pH (such as drinking water used for bathing and showering). This exposure pathway is unlikely to significantly contribute to fluoride body burden." (2) An abstract from a Chinese publication, Endemic Disease Bulletin 1989-01, by Zheng et al., reported on research regarding the absorption and excretion of fluoride introduced by various routes of exposure on a group of volunteers, the researchers stated that, "ionic fluoride in water cannot be absorbed by skin". (3)	1. Agency for Toxic Substances and Disease Registry. Toxicological profile for fluorides, hydrogen fluoride, and fluorine. U.S. department of Health and Human Services Public Health Service. September 2003. http://www.atsdr.cdc.gov/toxprofiles/tp11.pdf 2. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating

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	Another possible exposure pathway when showering or bathing is inhalation. No studies on the inhalation of fluoride from showering or bathing were found. SCHER states that this exposure pathway is unlikely to contribute significantly to the body burden of fluoride in the general population (2).	agents of drinking water. Brussels: European Commission, Directorate C, Public Health and Risk Assessment. 2010. http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf 3. Zheng Y, Wu J, Wang G. Experimental studies on fluoride absorption and excretion. Endemic Disease Bulletin, 1989-01 (Chinese). http://en.cnki.com.cn/Article_en/CJFDTOTAL-DFBT198901015.htm
7. The research on fluoride does not report on all the variables and therefore the data is no good. The research does not include good scientific methodology.	Similar to any health-related topic, there are high and low quality studies on community water fluoridation. The scientific method of summarizing decades of research is to conduct a systematic review. Systematic reviews assess all studies on a particular topic to answer a research question (e.g. is community water fluoridation safe?). Researchers select the highest quality studies based on pre-defined criteria such as the risk of bias, the potential for confounding factors (i.e. other variables that can affect the outcome) and the study design. The results of the highest quality studies are combined and summarized. All recent systematic reviews have concluded that community water fluoridation poses no risk to human health and is effective in reducing tooth decay: one was conducted by the British Medical Journal in 2000 which assessed 214 published and unpublished studies since 1945 in any language (1); and one conducted by the National Health and Medical Research Council of Australia (NHMRC) in 2007, which assessed 77 English-language studies published since 1996 (2).	1. BMJ 2000;321:855. http://www.bmj.com/content/321/7265/855.full 2. A Systematic Review of the Efficacy and Safety of Fluoridation, NHMRC, 2007: http://www.nhmrc.gov.au/guidelines/publications/eh41a 3. American Dental Association. Fluoridation Facts, 2005.

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	More than 100 of the world's expert health and dental organizations currently support community water fluoridation based on the best available science (3). These provincial, national and international organizations include: Ontario • Ontario Association of Public Health Dentistry • Royal College of Dental Surgeons of Ontario • Chief Medical Officer of Health of Ontario • Ontario Medical Association • Association of Local Public Health Agencies (alPHa) • Ontario Dental Association • Ontario College of Dental Hygienists Canada • Health Canada • Canadian Association of Public Health Dentistry • Canadian Medical Association • Canadian Dental Association • Canadian Public Health Association • Canadian Pediatric Society • Canadian Cancer Society International • World Health Organization (WHO) • Pan American Health Organization (PAHO) • Centers for Disease Control and Prevention (CDC) • Recent US Surgeon General's Report • Federation Dentaire Internationale (FDI) • American Cancer Society • American Medical / Dental Associations Locally, a number of groups in Orillia support community water fluoridation. These include: • Simcoe Muskoka District Health Unit Board of Health • Leadership Council of the North Simcoe Muskoka LHIN • Muskoka Simcoe Dental Society (including Orillia)	

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	• Orillia Soldiers' Memorial Hospital
	  • Board of Directors
	  • Department of Family Medicine
	  • Department of Paediatric and Neonatal Medicine
	  • Medical Advisory Committee	

8. Why hasn't there been a double blinded, randomized placebo controlled clinical trial conducted on community water fluoridation, such as what the Region of Peel Council has asked for?	Recently, the Region of Peel Council included the following statement in a motion passed on January 12, 2012: "…that at least one properly conducted, double blinded, randomized placebo controlled clinical trial be used to provide effectiveness as the basis for a new drug classification" (Peel Region January 12, 2012 Regional Council Minutes). A double blinded, randomized, placebo-controlled clinical trial is the most unbiased method of measuring the safety and efficacy of a new drug but it is not possible to conduct this type of study for an intervention administered through a medium such as the municipal water supply to the whole community such as water fluoridation. Randomized studies are those in which study participants are randomly selected to be in either the "intervention" group (i.e. who takes the new drug) or the "placebo" group (i.e. who take the placebo). Double-blinded means that neither the study participants nor the investigators know who is taking the drug and who is taking the placebo, which minimizes the risk of bias. For a community-wide intervention such as water fluoridation, a double-blinded placebo-controlled clinical trial would require that whole communities are randomly selected to either receive water fluoridation or to receive a placebo. A placebo is an inactive substance meant to resemble the active substance. In this case, the active substance is fluoride so municipal water operators in the placebo communities would have to insert a similar-looking but inactive substance into the water supply to ensure that even the water operators are blind to their fluoridation status. It is simply not feasible to blind every person in every community to whether they are receiving fluoridated water or not over the amount of time required to study long-term effects. Even if individuals (as opposed to communities) were randomly assigned to receive water fluoridation or a placebo, study participants would have to drink their assigned type of water (i.e. fluoridated or non-fluoridated) for a considerable length of time to	

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	study the effects. This is also not feasible considering how often people drink water from various sources. Even though randomized, double-blinded, placebo controlled trials are not possible, high quality research can be conducted on community-wide interventions. They usually involve randomizing communities to receive an intervention or be the "control" (i.e. receive no intervention) community. It's also crucial to measure and account for all differences between communities that may affect the outcome.	
9. A local newspaper poll shows very low support for CWF.	For the issue of community water fluoridation in Orillia, the people whose opinion is relevant are those who consume water from the municipal water system. In order to get a 100% unbiased opinion from this group, every person who consumes Orillia's water would have to provide a response. Since this is not feasible, a sample (or fraction) of the group can be surveyed and the responses can be generalized as long as the sample is representative. The most basic method of selecting a representative sample is to randomly select people from the population. Surveying people who read the local newspaper on-line and choose to respond to a survey question is not a random sample of the population and thus is subject to the following biases: • Non-response bias occurs when people who answer the survey are different in meaningful ways from people who don't. For example, people who use the Internet may be (on average) younger and/or higher income than those who do not (1). Among Internet users, people who read the local newspaper differ significantly from those who do not. • Voluntary response bias leads to an over-representation of people with strong opinions. For example, among people who read the survey those with the strongest opinions about this issue are more likely to respond than those who do not. • Responses to the on-line survey are not restricted to the citizens of Orillia. Along with many other Ontario public health units, the Simcoe Muskoka District Health Unit participates in the Rapid Risk Factor Surveillance System (RRFSS), a monthly telephone survey of a random sample of 100 adults aged 18 years and older	1. StatsCan Individual Internet use and E-commerce survey, 2010. 2. Rapid Risk Factor Surveillance System: www.rrfss.ca.

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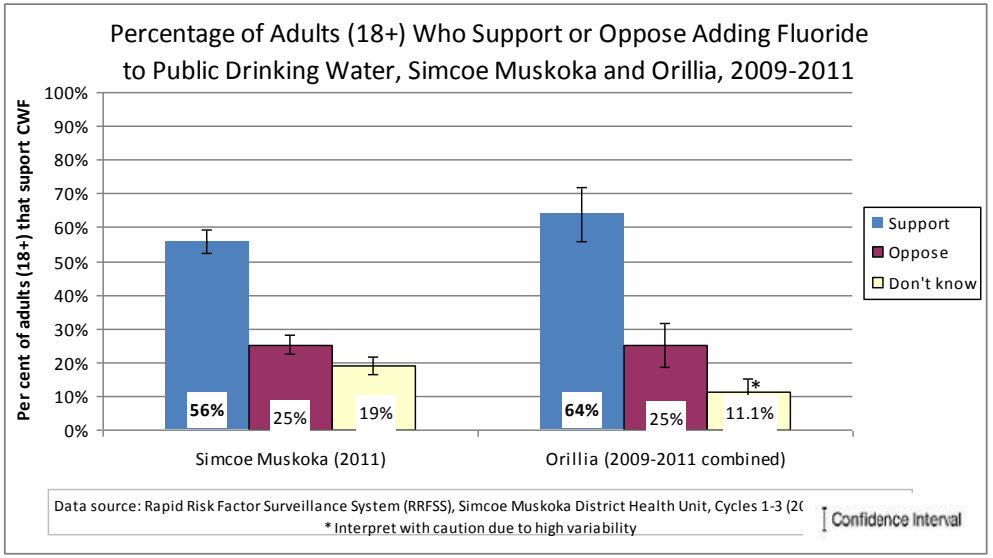
	in Simcoe Muskoka regarding topics of importance to public health (2). The telephone survey is conducted by a third party (the Institute for Social Research at York University) on behalf of all participating health units using random digit dialing. Telephone surveys are also subject to non-response bias because not everyone has a phone. However, the number of people with a phone is higher and more representative than the number of people who read a local on-line newspaper. The fact that telephone owners are randomly sampled minimizes the voluntary response bias. In 2009 and 2011, a question about water fluoridation was added to RRFSS in Simcoe Muskoka. The results are below and indicate that 64% (95% confidence interval: 56%-71%) of randomly selected adults who reside in Orillia supported adding fluoride to public drinking water.  	

ISSUE/CONCERN	HEALTH UNIT RESPONSE	REFERENCES
10. CWF is mass medication that is forced on people.	In Ontario and most regions in North America, fluoridation is brought into communities by a democratic process involving open public discussions and a voting process of some kind. This consent by the overall community, either determined through a plebiscite or a vote by the elected council, is considered to be very important because water fluoridation is a measure that is difficult for individuals living in urban areas to opt out of (1). Fluoride is not a medication. It is a mineral additive. Dairy companies add vitamin D to milk to help build strong bones. Vitamins are not considered to be medication and they are added to fruit juice, bread and pasta. Cereal companies put folic acid into cereal to help mothers give birth to healthy babies. Iodine is added to salt to prevent hypothyroidism.	1. British Medical Association, Fluoridation of water. http://www.bma.org.uk/health_promotion_ethics/environmental_health/Fluoriwater.jsp
11. There needs to be an open debate about the issue of CWF.	The public consultation and review process was developed, and approved by Orillia City Council on September 12, 2011, with the following objectives: • Provide Council with unbiased and factual information about fluoridation. • Raise the level of awareness about fluoridation among the citizens of Orillia. • Provide an opportunity for citizens of Orillia to hear about and be heard about fluoridation. • Achieve an open and transparent consultative process that will respect and address the views and concerns of the citizens of Orillia. In order to achieve these objectives the City communicated the contents of their consultation process, as posted on their website. This consultation allows for submissions to City staff by March 30th, to be included in their review and report to City Council. Consultation also included a public meeting to receive input and deputations on February 29th, and a public meeting on May 29th to present and review the draft report. In addition, City staff and staff of the Simcoe Muskoka District Health Unit have participated in meetings with a number of community groups. This included the presentation by Dr. Paul Connett from the Fluoride Action Network held at the Orillia campus of Lakehead University on February 15th. Participation in these venues has been robust. Notes taken at these meetings have been submitted to City staff for their report.	

ISSUE/CONCERN	HEALTH UNIT RESPONSE	REFERENCES
	The approved process has been followed faithfully and has served the objectives in allowing for vigorous participation by the public. The issues, views and questions raised will be best addressed with a continuation of the review process as approved by Council. It is intended that all matters raised will be included in the report, as well as responses based on a thorough and balanced review of the findings of the scientific research addressing these matters. With regard to the request for a public debate, the public meeting on May 29th will allow for a review of the findings of the draft report. This meeting will be an opportunity for discussion and response by City staff, and by expertise that they may call upon, including staff from the Simcoe Muskoka District Health Unit, to the questions, concerns and views raised within the report and by the attendants at the public meeting. The contents of the discussion at this public meeting will be influential in the creation of the final draft of the report to be submitted to Orillia City Council in June.	
12. More money needs to be spent on education rather than on CWF.	Under the requirements of the Ontario Public Health Standards (OPHS), the health unit's oral health team provides dental screening in all elementary schools in Orillia. The grades screened are determined by the risk level of the school. Children who are eligible based on clinical assessment are offered scaling, pit and fissure sealants or topical fluoride. There is no provision in OPHS for oral health promotion or education in schools. However, educational sessions may be offered upon request if staff is available to provide sessions. Educational resources for teachers are available on the health unit's website in both English and French. Providing comprehensive oral health classroom education in all schools in Simcoe Muskoka would require hiring an additional three to five oral health staff. Education will not address the issue of decreased access to professional dental care for people of low socio-economic status. Community water fluoridation provides preventive care for those who cannot afford to see a dentist. Additionally, community water fluoridation provides benefits over and above other sources of fluoride such as fluoridated toothpaste.	

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13. The costs of fluorosis are not factored into the $38 savings figure.	The statement, "For most cities, every $1 invested in water fluoridation saves $38 in dental treatment costs." is from "Fluoridation Facts" published by the American Dental Association (1). Fluoridation Facts references this statement to an article by Griffen et al (2). The authors of the article indicate that the cost savings from community water fluoridation were calculated using the formula: *Costs Disease Averted and Productivity Losses Averted = (Caries Increment Non-fluoridated) *(Effectiveness Water Fluoridation) * (Average Discounted Lifetime Cost of Carious Surface),* where, *Caries Increment Non-fluoridated = annual increment of decayed, missing, and filled surfaces (DMFS) in persons not exposed to fluoridated water, Effectiveness Water Fluoridation = I (DMFS Fluoridated - DMFS Non-fluoridated) / DMFS Non-fluoridated I.* The costs of treating dental fluorosis were therefore not part of the formula used by Griffen et al. However, it is important to note the following: 1. Consuming fluoridated water at 0.7 parts per million (ppm) is not statistically significantly associated with fluorosis of aesthetic concern in the most recent systematic reviews (3). 2. The percentage of children with moderate to severe dental fluorosis or fluorosis of aesthetic concern in Canada is very low (< 0.3%) (4). 3. A study done in Simcoe Muskoka on 7-year-olds indicated no difference in the percentage of children affected by any dental fluorosis whether they lived in a fluoridated or non-fluoridated community (5). 4. Similar research done in Middlesex- London found no difference in the percentage of children affected by dental fluorosis of cosmetic concern whether they resided in a fluoridated or non-fluoridated community (6). Thus, as aesthetically significant fluorosis is not elevated with community water fluoridation the lack of inclusion of associated treatment costs would not affect the accuracy of the cost effectiveness findings from Griffen et al.	1. Fluoridation Facts. American Dental Association. 2005. 2. Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. J Public Health Dent 2001;61(2):78-86. 3. A Systematic Review of the Efficacy and Safety of Fluoridation, NHMRC, 2007: http://www.nhmrc.gov.au/guidelines/publications/eh41a 4. Report on the Findings of the Oral Health Component of the Canadian Health Measures Survey 2007-9. Health Canada 2010. 5. Ito D. A Cross-Sectional Study to Compare DMFT Scores of 7 year-old Schoolchildren in Simcoe Muskoka. 2008. 6. Middlesex-London Health Unit, Perth District Health Unit Fluorosis Survey 2008.

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14. If the health unit is serious about preventing dental decay it should provide more dental hygienists to hand out toothbrushes, stop fast food outlets from selling pop, and having PHN's educate people about better eating habits.	The health unit currently provides oral health services to people in Orillia, particularly children and youth in elementary and secondary schools. The oral health team visits all elementary schools and as a minimum performs a dental screening for all JK, SK Grade 2 and Grade 8 students. Others are seen at the request of a parent or guardian. The oral health team visits high schools and offers to screen youth. The team also provides preventive services (pit and fissure sealants, and topical fluoride treatments) to eligible consenting children in elementary schools. The health unit administers the Children in Need of Treatment (CINOT) Program for urgent dental care for children and youth to age 18 and the Healthy Smiles Ontario program which provides comprehensive dental care for children of low income families. The Healthy Smiles team provides topical fluoride three times a year to preschoolers in daycare with parent's consent and a risk assessment completed. The health unit's chronic disease prevention - healthy lifestyle program has public health nurses and registered dietitians working extensively with local school boards, schools and food service providers to support the implementation of the School Food and Beverage Policy in schools. This policy outlines nutrition standards for food and beverages sold in all venues on school property (e.g. cafeterias, vending machines, tuck shops); through all programs in schools (e.g. catered lunch programs); and at all events on school property, including bake sales and sport events. The health unit also works with school boards, schools and community partners on the implementation of programs such as Nutrition Tools for Schools and the Student Nutrition Programs. Work is also done with municipalities to implement nutrition standards in recreation facilities through the Eat Smart! Recreation Centre Program. This ensures there are healthier choices in snack bars and vending machines. The health unit also has a goal of supporting healthy eating choices by encouraging an increase in the consumption of plant based foods and a reduction in the consumption of processed foods. The health unit works extensively with many community partners to increase awareness of the importance of healthy eating. The	1. Methods from City of Hamilton Public Services, November 17, 2008. "Assessment of Fluoridation of Water and Other Methods of Delivering Fluoride-BOH08024(a) – (City Wide)" applied to City of Orillia data.

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<tr><th>ISSUE/CONCERN</th><th>HEALTH UNIT RESPONSE</th><th>REFERENCES</th></tr>
<tr><td></td><td>best available evidence is used to create information and resources for the public to support making the healthy choice the easy choice. The Board of Health also endorsed a resolution urging Canadian decision-makers to prohibit all commercial advertising of food and beverages to children under the age of thirteen years.

Using population data from Statistics Canada Community Profile for the City of Orillia (2006), below are estimated costs of providing topical application of fluoride by public health dental hygienists and by private dentists (1).

A) All children, all seniors, and adults under LICO (Low Income Cut Off)
B) All children, all adults under LICO
C) All people under LICO

Option 1: Topical application by public health dental hygienists 2 times per year plus promotion of service

<table>
<tr><th>Option 1</th><th>Target Population</th><th>Annual Budget</th><th>Other Annual Costs</th><th>One Time Cost</th></tr>
<tr><td>A</td><td>14,613</td><td>$650,514</td><td>0</td><td>$749,505</td></tr>
<tr><td>B</td><td>8,818</td><td>$398,909</td><td>$3,191</td><td>$457,696</td></tr>
<tr><td>C</td><td>3,026</td><td>$141,213</td><td>$1,729</td><td>$158,504</td></tr>
</table>

Limitations:
• Of choosing A: Budget pressures and negative impact on oral health of low-risk population.
• Of choosing B: Budget pressures and negative impact on oral health of seniors and low-risk populations.
• Of choosing C: Budget pressures and negative impact on oral health of seniors and children as well as low-risk population.

Option 2: Topical application by private dentists twice per year plus promotion of service</td><td></td></tr>
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<tr><th>ISSUE/CONCERN</th><th>HEALTH UNIT RESPONSE</th><th>REFERENCES</th></tr>
<tr><td></td><td>
<table>
<tr><th>Option 2</th><th>Target Population</th><th>Annual Budget</th><th>Other Annual Costs</th><th>One Time Cost</th></tr>
<tr><td>A</td><td>14,613</td><td>$1,404,733</td><td>0</td><td>$12,822</td></tr>
<tr><td>B</td><td>8,818</td><td>$852,406</td><td>$3,191</td><td>$11,212</td></tr>
<tr><td>C</td><td>3,026</td><td>$293,954</td><td>$1,729</td><td>$7,551</td></tr>
</table>
Limitations:
• Of choosing A: Budget pressures and negative impact on oral health of low-risk population.
• Of choosing B: Budget pressures and negative impact on oral health of seniors and low-risk populations.
• Of choosing C: Budget pressures and negative impact on oral health of seniors and children as well as low-risk population.
</td><td></td></tr>
</table>

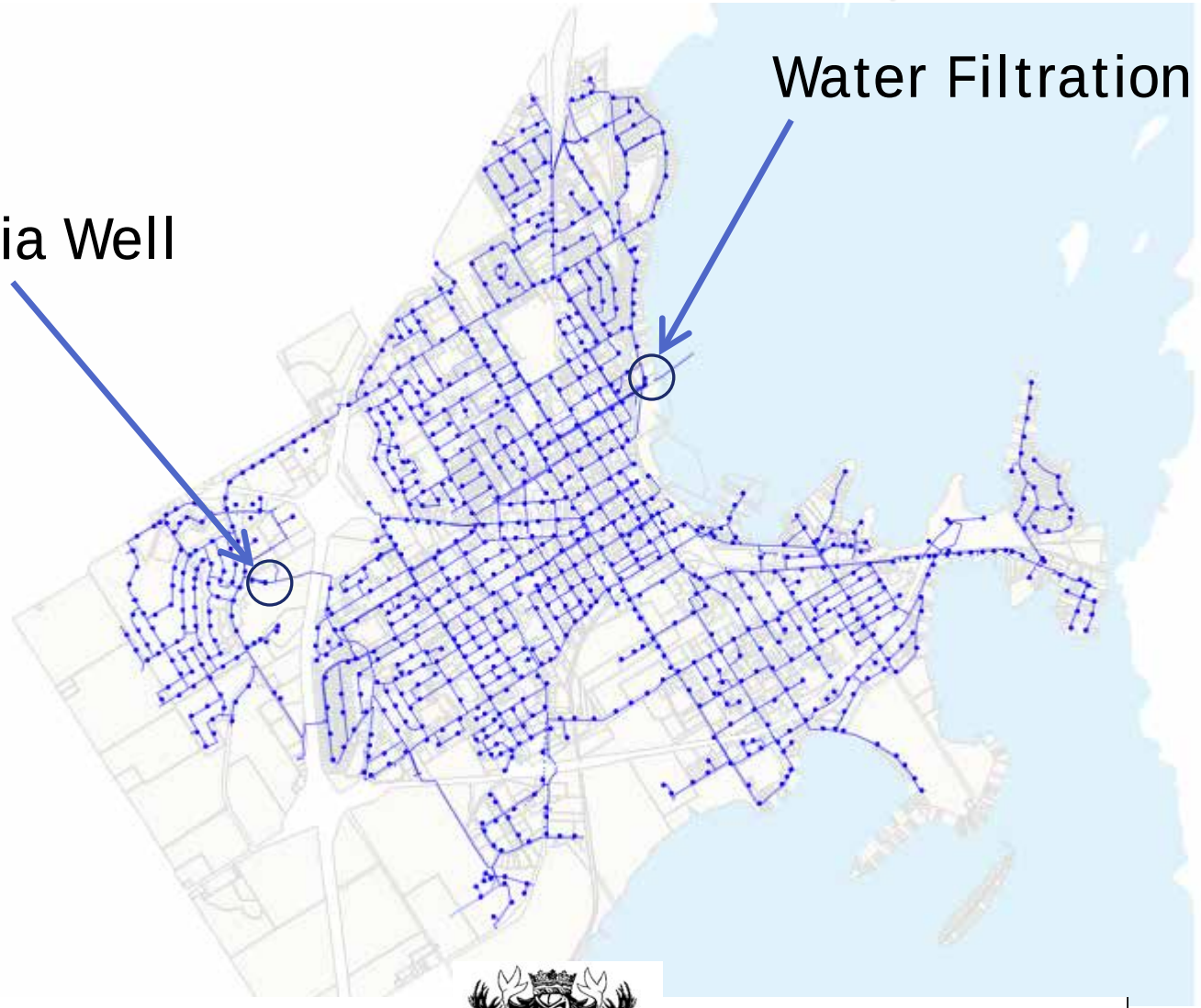
Fluoridation Public Consultation

- Public consultation process with assistance from Simcoe Muskoka District Health Unit (SMDHU)
- 2009 SMDHU report
- Council direction to Public Works
- Public Consultation Objectives

Dates to Remember

- Feb 29, 2012 – 1st Public Forum (Information gathering)
- March 30, 2012 – deadline for public input
- May 29, 2012 – 2nd Public Forum (Reporting back)
- June 2012 – Report to Council

Water Distribution System



City of Orillia

Fluoridation Equipment

- Fluoridation systems at both WFP and West Orillia Well include:
  - Fluoride feed system
  - Chemical storage
  - Fluoride feed line and injection point
  - Fluoride Analyzer
- Systems are fairly simple. Similar to Chlorine systems.

Chemical Storage & Fluoride Feed System Room


Fluoride Feed System

Fluoride Analyzer

More Information

- City of Orillia website: www.orillia.ca
- Contact:

  Jason R. Covey, P. Eng.

  City of Orillia

  Public Works - Engineering Division

  50 Andrew St. S., Suite 300

  705-325-2227 or jcovey@orillia.ca
- Simcoe Muskoka District Health Unit

simcoe muskoka
DISTRICT HEALTH UNIT

Dr. Charles Gardner, Medical Officer of Health
City of Orillia Public Meeting
February 29, 2012

Community Water Fluoridation

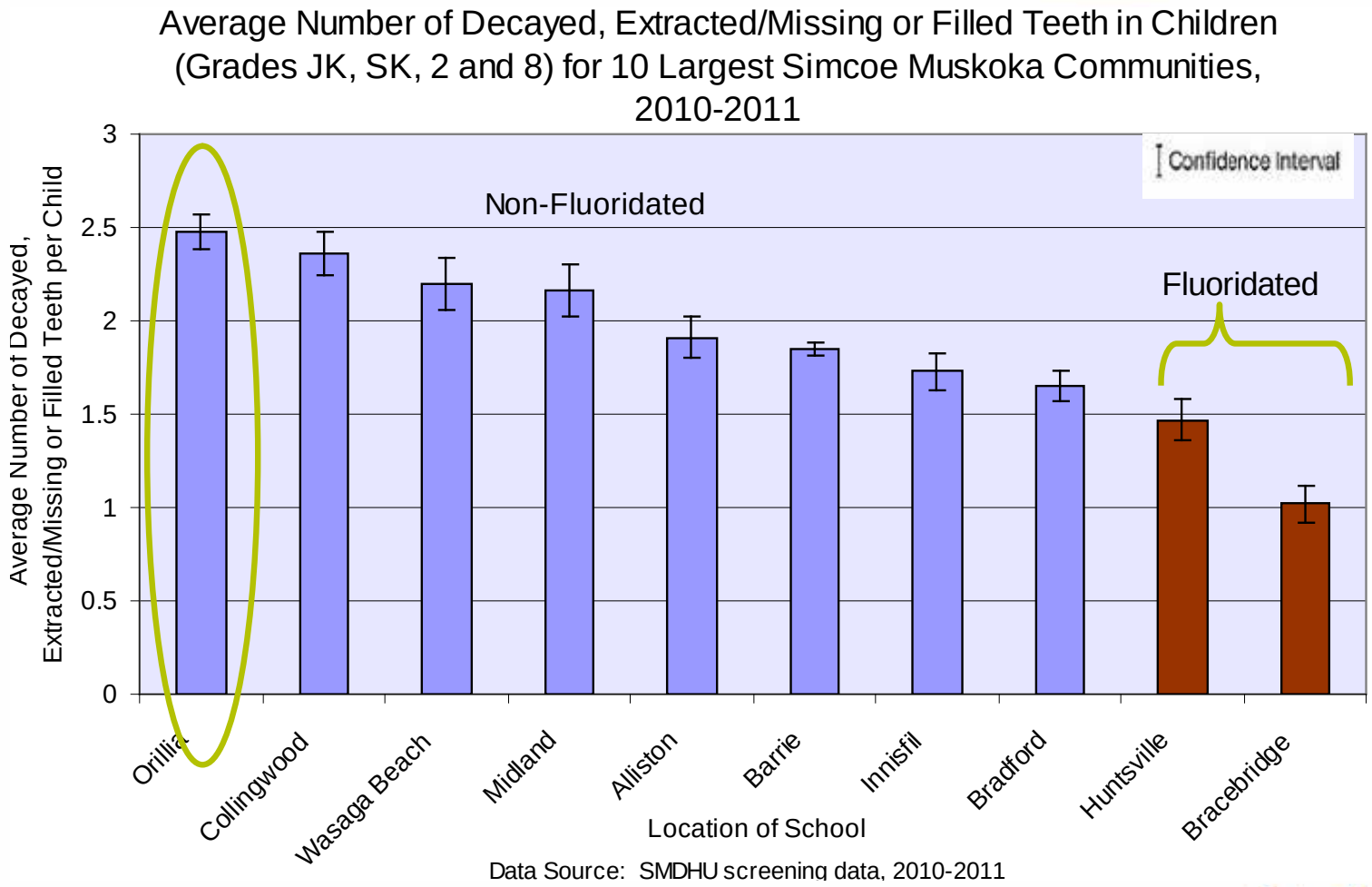
Begin a Legacy of Healthy Teeth in Orillia

Reviewing fluoridation in Orillia

- The Health Unit has a legal mandate to protect and promote health, and to prevent disease in Orillia, Simcoe, Muskoka and Barrie.
- Orillia's children have the most decayed teeth among the 10 largest communities in Simcoe Muskoka (SMDHU screening data, 2009-2011).
- Systematic reviews of the research have concluded that fluoridation is a safe and effective way to reduce tooth decay.
  - Added benefit to a healthy diet, oral hygiene, and dental care. Particularly important for those of lower income.
- Fluoridation is a challenging, polarizing issue.
  - Perceived health risks, vulnerable groups such as infants / children, industrial source, and concerns regarding legality and rights.
  - Our goal: to provide accurate, valid, science-based information and advice.

simcoe muskoka
DISTRICT HEALTH UNIT

Orillia's high rate of child dental decay

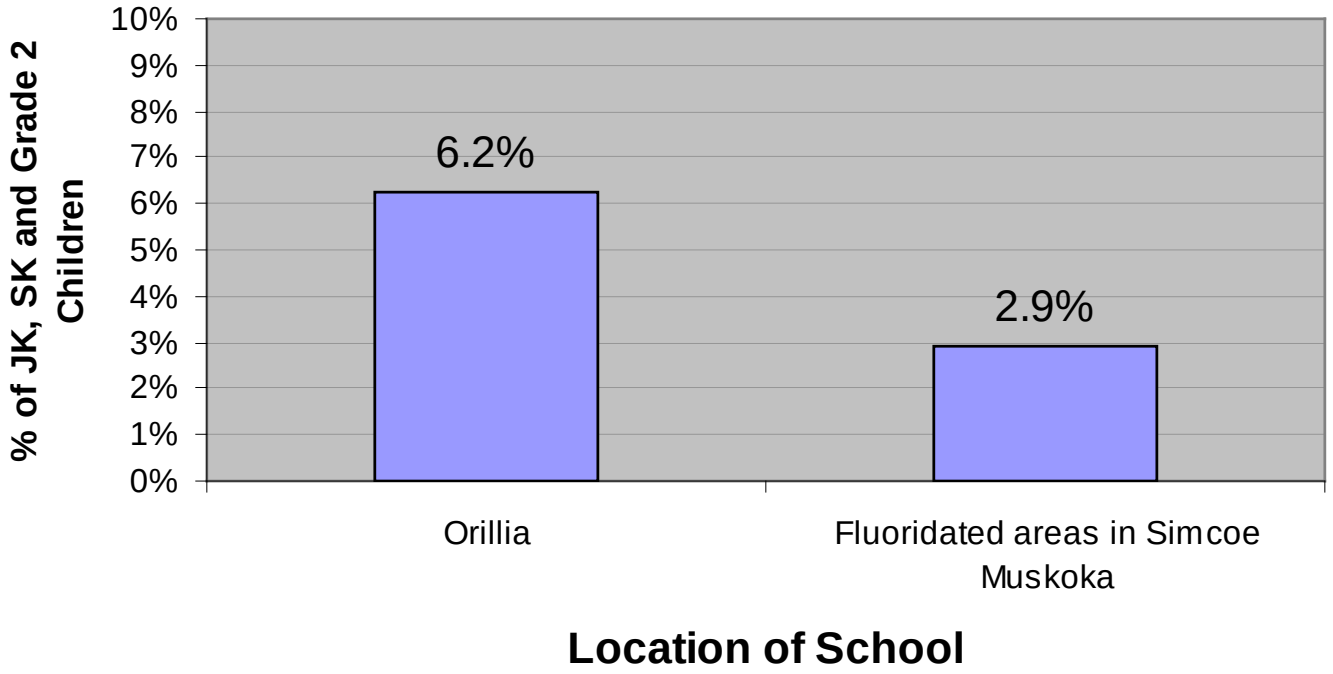


simcoe muskoka
DISTRICT HEALTH UNIT

Elevated severe dental decay in Orillia

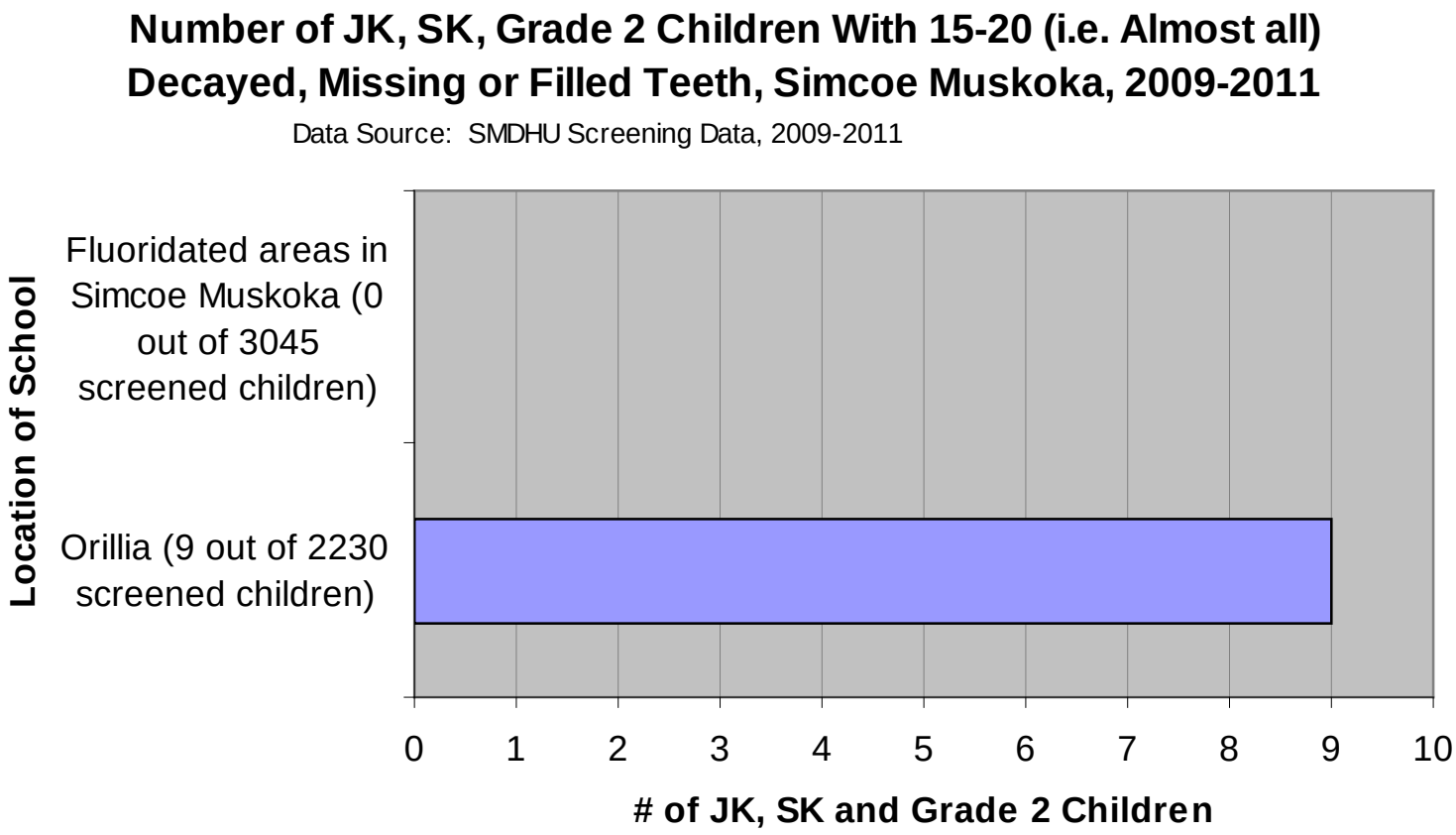
Percentage (%) of JK, SK and Grade 2 Children with 10 (i.e. half) Or More Decayed, Missing or Filled Teeth, 2009-2011

Data Source: SMDHU Screening Data, 2009-2011



simcoe muskoka DISTRICT HEALTH UNIT

Elevated severe dental decay in Orillia



simcoe muskoka
DISTRICT HEALTH UNIT

Similar cities, different decay rates

A comparison of Orillia with St. Thomas, Ontario

Decay Rates for JK, SK, Grade 2, 2010/11	**Orillia** (**No** water fluoridation)	**St. Thomas** (**100%** of population has water fluoridation)
2006 Population (2006 Census)	30,260	36,110
Average number of decayed, missing or filled teeth per child	**2.5**	**1.4**
Percent of children with cavities	**44%**	**15%**

Source: SMDHU screening data 2010-2011 and data provided by Elgin/St. Thomas Public Health Unit

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What is fluoride and fluoridation?

- Fluoride is a mineral that naturally occurs in rocks, soil, and water.
  - Fluoride makes the outer layer of teeth (the enamel) stronger.
  - Hydrofluorosilicic acid used for CWF. Produced during phosphate production – National Sanitation Foundation standards.

- Fluoridation: adding fluoride to municipal water supply to the concentration range to **optimize dental benefits while avoiding adverse effects.**
  - ***Health Canada***
    - Maximum Acceptable Concentration is 1.5 parts per million.
    - ***Recommended 0.7 ppm for dental benefits.***
    - Supported by measurements of fluoride consumption rates for children and adults.
  - ***Ontario Safe Drinking Water Act: 0.5 to 0.8 ppm fluoride*** required for CWF.

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Evidence: Appraising scientific literature

Systematic Reviews

- To answer a question
  - Example: Does fluoridation cause cancer?
- Examines all relevant articles.
- Considers the quality of articles.
- Draws conclusions based on the overall findings of studies of acceptable quality.

Selective Reviews

- To prove a point.
- Picks and chooses articles to support the point to be made.
- No quality criteria.

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Major scientific research and reviews

- Health Canada Expert Panel, 2007
- Oral Health in America
  A Report of the Surgeon General, 2000.
- Systematic Review of Water Fluoridation
  UK/International study, 2000.
- Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States US CDC, 2001.
- Forum on Fluoridation Ireland, 2001.
- A Systematic Review of the Efficacy and Safety of Fluoridation
  National Health and Medical Research Council, Australian Government, 2007.

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Studies on the prevention of tooth decay

- Review of studies comparing communities with and without water fluoridation, meeting selection criteria for relevance and quality.

  Outcomes:

  - 35 original studies (2 systematic reviews): before-after, cross sectional, prospective / retrospective cohort, time series studies.
  - **14.3% - 15.5%** increase in children free of dental decay.
  - Reduction of **2.61** decayed / missing / filled teeth per child.

A Systematic Review of the Efficacy and Safety of Fluoridation. National Health and Medical Research Council, Australian Government, 2007

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Dental fluorosis

- Dental fluorosis can occur with increased levels of fluoride consumption.
  - Fluorosis (mild): fine white streaks across the crowns of teeth. Not a health condition.

Vermont Department of Health

- The prevalence of visually apparent fluorosis is very low with community water fluoridation (0.5 to 0.8 ppm).
- No increase in moderate / severe fluorosis with infant formula feeding.
- The prevalence of moderate dental fluorosis in Canada is low, and declining since 1996.

Findings and Recommendations of the Fluoride Expert Panel. Health Canada. January 2007: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php

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Safety of water fluoridation

- The evidence from research does **not** support a link between exposure to fluoride in drinking water at 1.5 ppm and any adverse health effects, including:
  - Cancer
    - McDonagh review (2000) of 26 studies: 24 found no increase, 1 found an increase, 1 found a reduction in cancer rates.
    - Osteosarcoma – Bassin study (2006) found an increase for 7 y.o. boys - Douglas letter (2006), larger data set found no increase. Kim study (2011) with more accurate exposure measurements (bone fluoride concentrations) found no increase in cancer.

Fluoride in Drinking Water. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water. Health Canada. Comment period ended November 27, 2009: http://www.hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/draft-ebauche-eng.php#t5

An Assessment of Bone Fluoride and Osteosarcoma. Kim et al. J Dent Res 90(10):1171-1176, 2011.

Safety of water fluoridation

- The evidence does **not** support a link between exposure to fluoride in drinking water at 1.5 ppm and any adverse health effects, including:
  - Immunotoxicity
  - Reproductive / developmental toxicity
  - Genotoxicity
  - Fractures / skeletal fluorosis
  - Neurotoxicity / intelligence
    - Studies of communities in China, Mexico – high fluoride concentrations, other causal factors (eg. lead, iodine) not reported.
    - “There are significant concerns regarding the available studies, including quality, credibility, and methodological weaknesses.”

Fluoride in Drinking Water. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water. Health Canada. Comment period ended November 27, 2009: http://www.hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/draft-ebauche-eng.php#t5

Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. Scientific Committee on Health and Environmental Risks. European Commission. 2010.

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Who supports CWF?

Orillia

- Simcoe Muskoka District Health Unit Board of Health
- Leadership Council of the North Simcoe Muskoka LHIN
- Muskoka Simcoe Dental Society (including Orillia)
- Orillia Soldiers' Memorial Hospital
  - Board of Directors
  - Department of Family Medicine
  - Department of Paediatric and Neonatal Medicine
  - Medical Advisory Committee

Ontario

- Ontario Association of Public Health Dentistry
- Royal College of Dental Surgeons of Ontario
- Chief Medical Officer of Health of Ontario
- Ontario Medical Association
- Association of Local Public Health Agencies (alPHa)
- Ontario Dental Association
- Ontario College of Dental Hygienists

Canada

- Health Canada
- Canadian Association of Public Health Dentistry
- Canadian Dental Association
- Canadian Public Health Association
- Canadian Pediatric Society
- Canadian Cancer Society

International

- World Health Organization (WHO)
- Pan American Health Organization (PAHO)
- Centers for Disease Control and Prevention (CDC)
- Recent US Surgeon General's Report
- Federation Dentaire Internationale (FDI)
- American Cancer Society
- American Medical / Dental Associations

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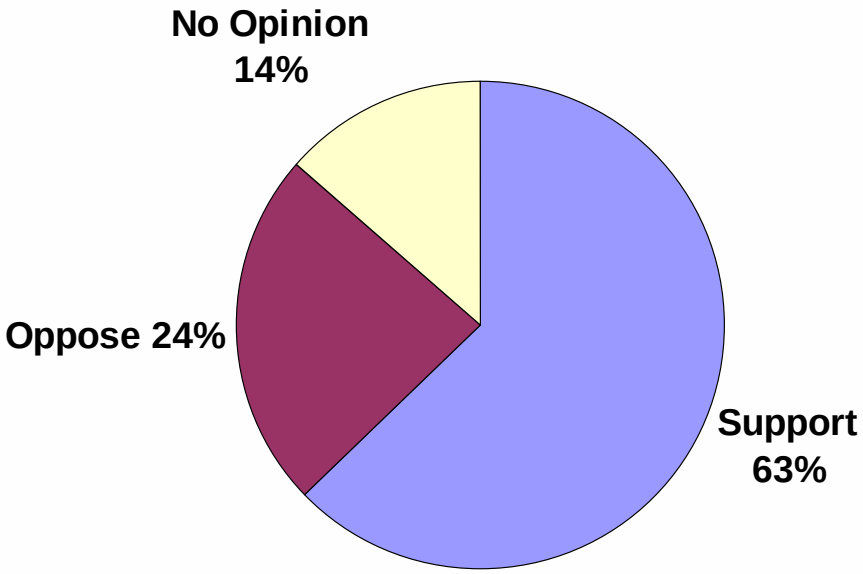
Public support for fluoridation

Public support for adding fluoride to municipal water in Orillia, 2009



Data source: Rapid Risk Factor Surveillance System (RRFSS), Simcoe Muskoka District Health Unit, Cycles 1-3 (2009)

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Other considerations

- Fluoridation is a collective solution to help reduce dental decay. Examples of other collective solutions:
  - Treating water with chlorine to provide safe drinking water.
  - Adding vitamin D to milk to prevent rickets and ensure healthy bones.
  - Adding iodine to salt to ensure healthy physical and mental development.
  - Adding folate the flour to prevent birth defects.
- Inexpensive and cost effective. Every $1 invested in community water fluoridation yields about $38 in savings each year from fewer cavities treated.[1]

[1]J Publ Health Dent 2001;61(2):78–86

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Conclusions

- Orillia has an elevated level of dental decay.
- Community water fluoridation is a safe, effective, and cost-effective public health measure that addresses inequalities in oral health, and benefits all members of the community.
- There is an opportunity to improve the oral health of the citizens of Orillia without compromising safety through community water fluoridation.

For more information visit the health unit's website at www.simcoemuskokahealth.org.

simcoe muskoka
DISTRICT HEALTH UNIT

Office of the Chief Dental Officer

Health Canada's Position on Fluoride

ocdo-bdc@HC-SC.GC.CA

Health Canada Santé Canada

Health Canada's Involvement to date.

- By Invitation;
- Present Science (from Health Canada's expert review panel);
- Present International Information;
- Respect Provincial / Territorial / Municipal Parameters.

Oral Health and Overall General Health

Dental disease is:

Øthe #1 chronic disease in children & adolescents;
(U.S. Surgeon General's Report, May 2000)
http://www.surgeongeneral.gov/library/oralhealth/

Øfive (5) times more common than asthma;

Øone of the main reasons preschool children receive a general anaesthetic;

Øthe second most expensive disease category in Canada;
http://www.fptdwg.ca/English/e-documents.html

Ø47% of Canadians have had dental disease by 6 years of age, 96% have had it in their lifetime.
http://www.fptdwg.ca/English/e-documents.html

ØOral health is linked to a number of systemic diseases.

In 2006, Health Canada initiated a review of fluoride. This process included:

- 3 external experts drafted technical reports on toxicology/intake of fluoride/risks & benefits (2006)

- External peer-review of technical reports by 3 experts (2006)

- Expert Panel Meeting with 6 experts & stakeholders (2007)

- Findings & Recommendations of Expert Panel Meeting (2008)

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php

Process continued…

- Guideline Technical consultation document prepared (2009)

- 2 month national public consultation undertaken (2009)

http://www.hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/index-eng.php

- Approval on the updated technical report received from 2 Federal-Provincial-Territorial Committees (2010)

- Release of Guideline Technical Document (2010)

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php

Findings of Review

Total Daily Intake:

- General decrease in recent years (Use of supplements has decreased and concentrations of fluoride in infant formulas have decreased)

Dental Fluorosis:

- First 3 years of age is period of most significant concern;
- Point of concern should be moderate dental fluorosis (Dean's Index);

Other Health Effects:

- No conclusive evidence related to bone fracture, cancers, intelligence quotient, skeletal fluorosis, immunotoxicity, reproductive and developmental toxicity, genotoxicity and neurotoxicity based on a Maximum Allowable Concentration (MAC) of 1.5 mg/L.

Recommendations from Review

- The MAC of 1.5 mg/L for fluoride in drinking water should be reaffirmed.

- To adopt a level of 0.7 mg/L as the optimal target concentration for fluoride in drinking water, which would prevent excessive intake of fluoride through multiple sources of exposure.

- Findings and recommendations of the Fluoride Expert Panel Meeting, January 2007.

http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php

On Health Canada's process:

"Health Canada has established a comprehensive process for developing new guidelines and reviewing existing ones that require an update. The process is consultative, transparent, and based on risk and science."

Commissioner on Environment and Sustainable Development in his report tabled in September 2005

http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200509_04_e_14951.html#ch4hd4a

Fluorosis → 6 - 12 year olds

Normal teeth	Questionable[1]	Very Mild	Mild	Moderate /severe[2]
60%	24%	12%	4%	<0.3%

[1] ill defined and could be due to antibiotic usage, infection, severe fever, trauma etc.
http://www.fptdwg.ca/English/e-documents.html

Note:

- Initial WHO central calibration
- Recalibration on first day of each new site
- Recalibration at mid point of each site
- Recalibration before end

[2] Statistics Canada criteria for withholding reporting value:

- Highly unstable numbers (<10)
- Coefficient of variation > 33.3%

For information regarding measures spread in data see the Statistics Canada web site:
http://www.statcan.gc.ca/edu/power-pouvoir/ch12/5214876-eng.htm

A Message from the Chief Public Health Officer

Water Fluoridation

Dental disease is the number one chronic disease in North America. It affects a staggering 96% of Canadian adults, is on the rise among young Canadian children in some areas, and poor dental health increases the risk of other diseases.

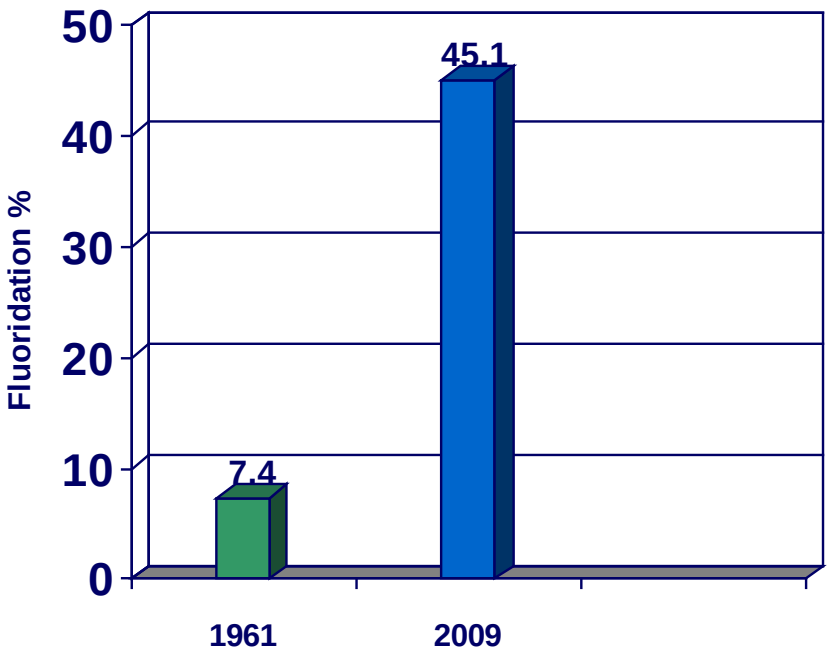
The Public Health Agency of Canada supports water fluoridation for our oral health. Simply put, it is a safe and cost effective public health measure which has the potential to benefit everyone, regardless of age, socioeconomic status, education, or employment.

David Butler Jones
Chief Public Health Officer of Canada

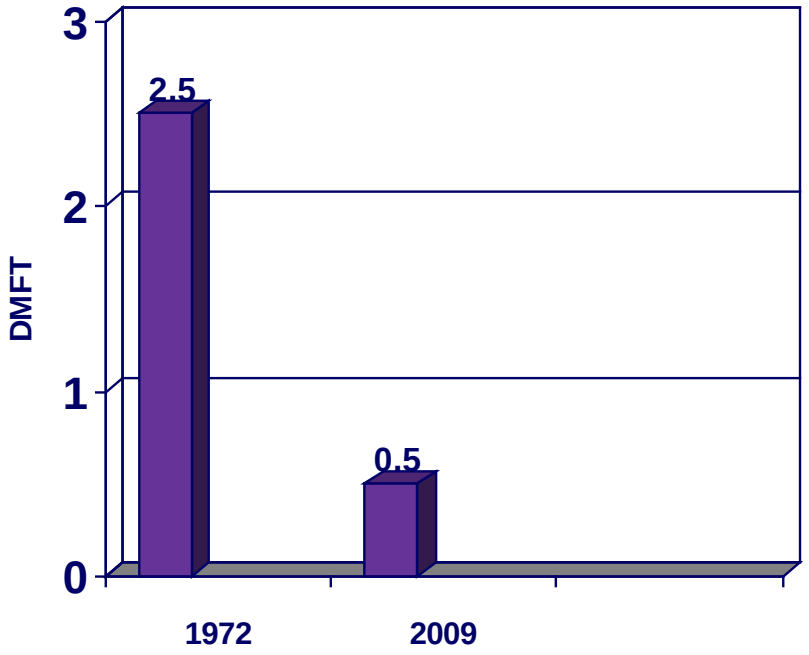
September 2011
http://www.phac-aspc.gc.ca/cpho-acsp/statements/20110913-eng.php

1961-2009 Trends in Water Fluoridation and Dental Decay in Canada.

Fluoridation %



Children's Decay (DMFT) Rates

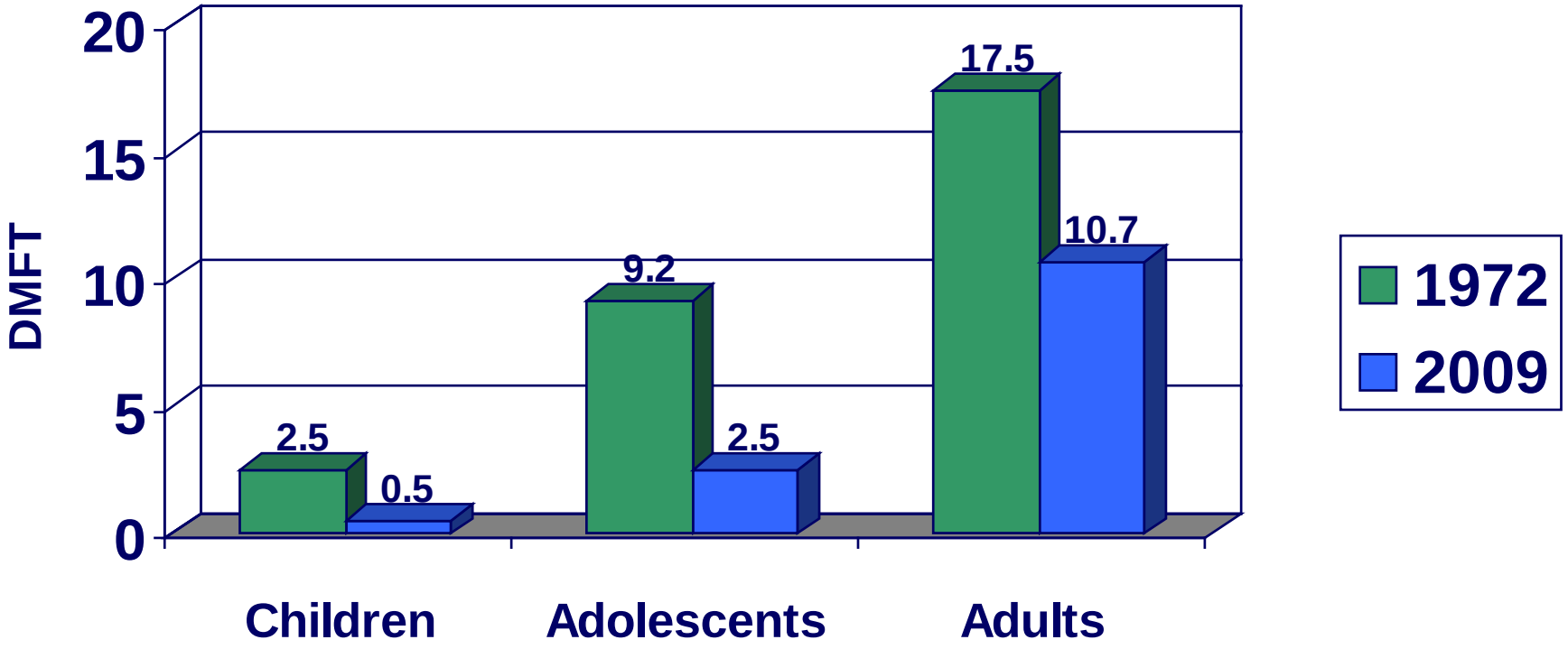


Dr. Carlos Quinonez, Faculty of Dentistry, University of Toronto

http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/fnihb-dgspni/ocdo-bdc/project-eng.php

http://www.fptdwg.ca/English/e-documents.html

1972 / 2009 Canadian Decay (DMFT) Comparisons.



* Although we have made great improvements in oral health in Canada, there is still a lot of work to be done.

http://www.fptdwg.ca/English/e-documents.html

Who supports Fluoridation?

- World Health Organization (WHO)
- Pan American Health Organization (PAHO)
- American Medical / Dental Associations
- Canadian Dental Association
- Health Canada (HC)
- Canadian Association of Public Health Dentistry
- Canadian Pediatric Society
- Canadian Public Health Association
- Toronto Public Health
- Centers for Disease Control and Prevention (CDC)
- Ontario Association of Public Health Dentistry
- Royal College of Dental Surgeons of Ontario
- Ontario College of Dental Hygienists
- Ontario Dental Association
- Recent US Surgeon General's Report
- Federation Dentaire Internationale (FDI)

Examples of Studies That Support Water Fluoridation

- Oral Health in America: A Report of the Surgeon General, 2000

http://www.cdc.gov/fluoridation/fact_sheets/sg04.htm

- Systematic Review of Water Fluoridation. UK/International study, 2000

http://www.bmj.com/content/321/7265/855.full

- Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. US Department of Health and Human Services Centers for Disease Control and Prevention, 2001

http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm

- Forum on Fluoridation. Ireland, 2001

http://www.dohc.ie/publications/pdf/fluoridation_forum.pdf?direct=1

- A Systematic Review of the Efficacy and Safety of Fluoridation. National Health and Medical Research Council, Australian Government, 2007

http://www.nhmrc.gov.au/publications/synopses/eh41syn.htm

Conclusions

Health Canada continues to recognize the benefits of community water fluoridation, and supports it as a safe and an effective method to prevent tooth decay.

Orillia Public Forum

Peter Van Caulart, Dip.A.Ed.,CES,CEI
Vice President, COF-COF

Our mission…

- To deliver evidence-based information about fluoridation to decision-makers; empower them to use it in the best interests of the public; and protect the vulnerable.

Definition

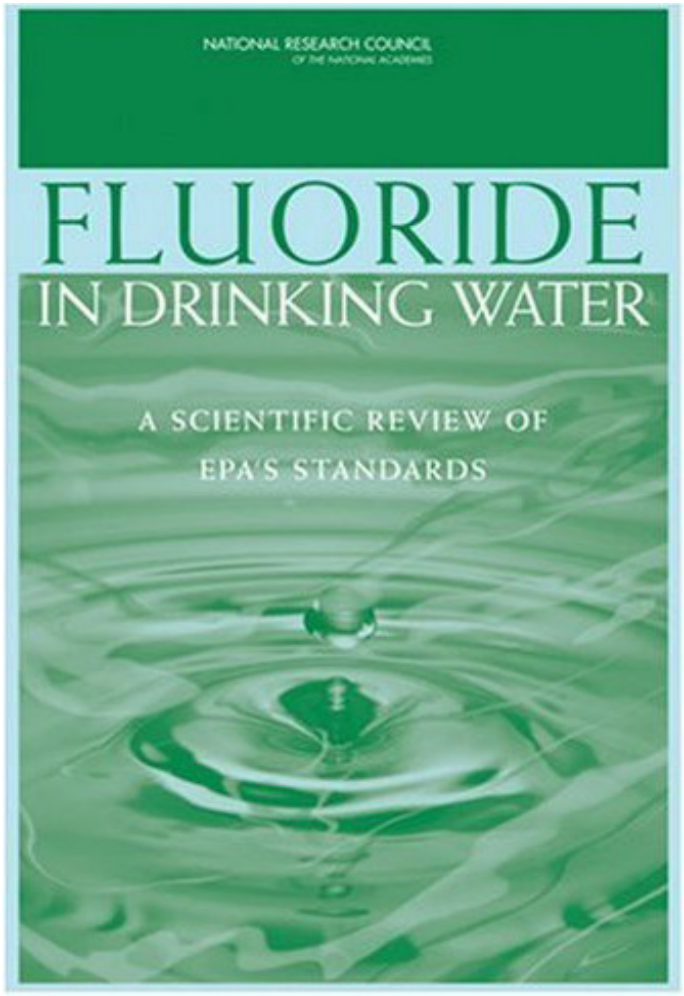
Water fluoridation:

A policy to add fluoride ions (F-) to treated drinking water for the purpose of treating humans without consideration of an individual's medical history, dosage or consent.

What’s Fluoride? NOT

- Chemically and atomically, fluoride (F-) is a halogen ion, not a mineral.
- Biologically, it’s an enzyme destroyer, not beneficial.
- Metabolically it’s an inhibitor, not a nutrient.
- In water, it’s a contaminant and in air, it’s a pollutant.

New Perspectives



This 2006 NRC report changes our understanding of fluoride compounds added to drinking water and fluoride's health effects.

Topical vs Ingested

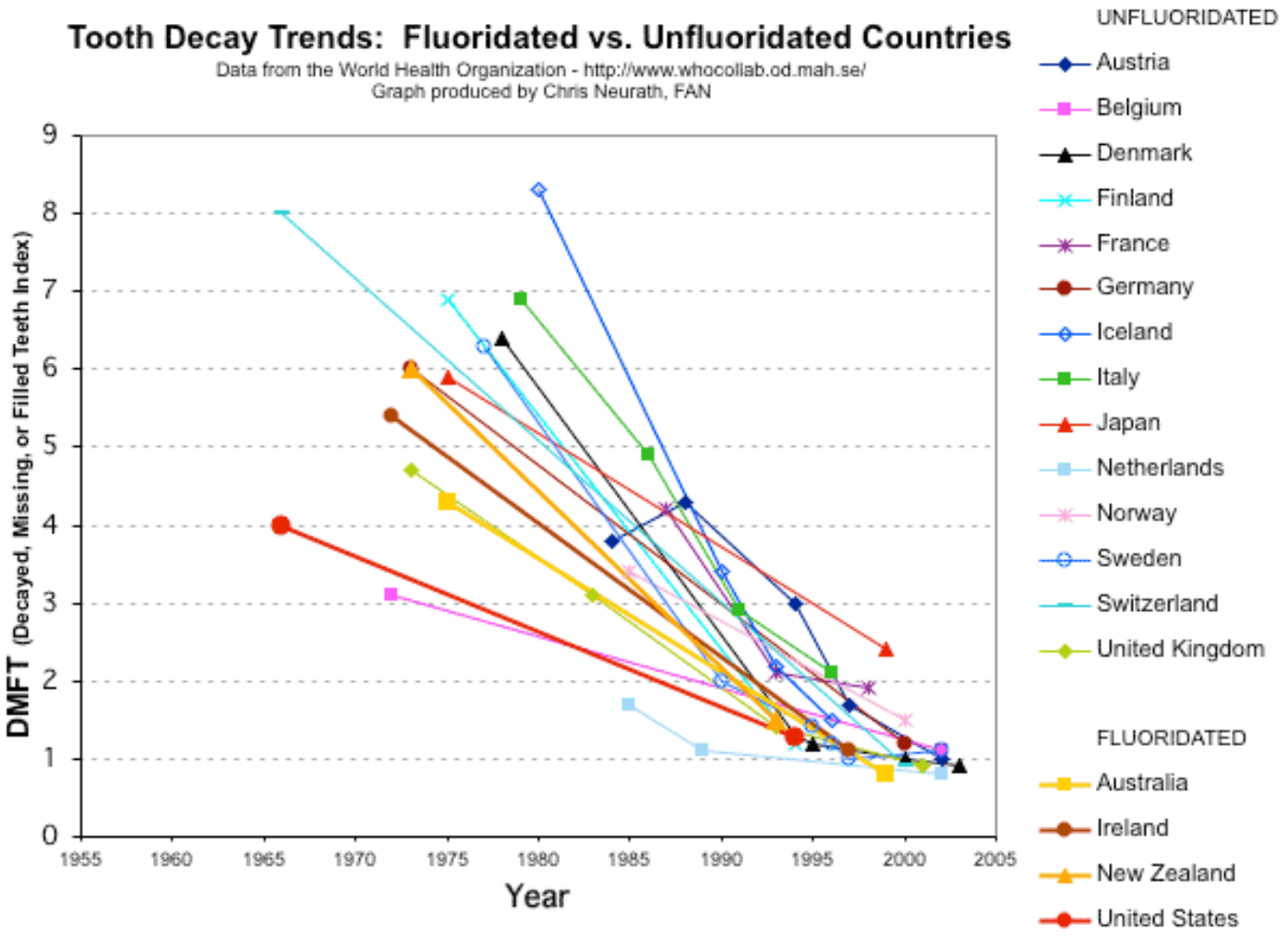
"…no reliable scientific evidence of significant dental benefit from ingested fluoride."

Canadian Dental Association consensus conference Nov. 1997

Ingested fluoridation is a myth

Global decay trends

World Health Organization



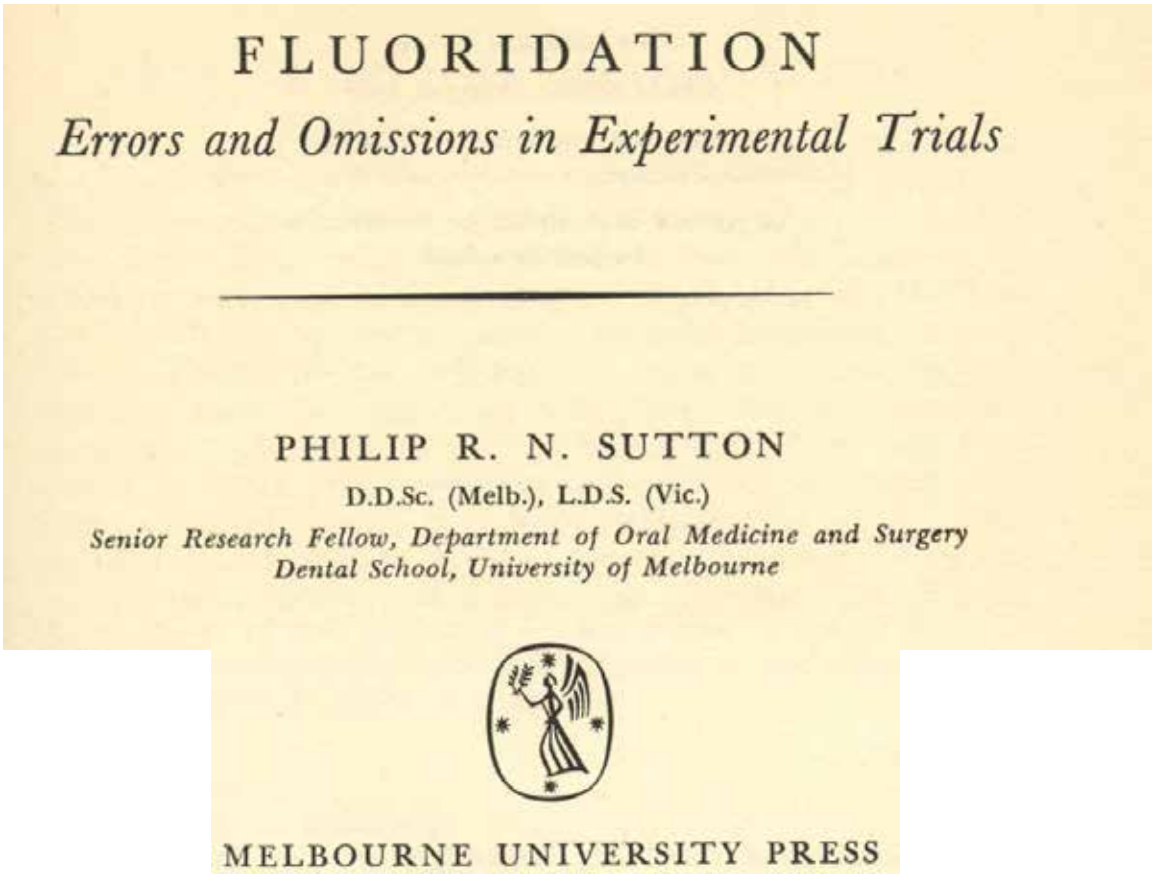
2007 Ingested fluoridation…
…not effective!

- Caledon - Unfluoridated
- Brampton - Fluoridated

“The effect of fluoridation on caries in these communities was not evident”

Dr. Dick Ito 2007 - U of T School of Dentistry
(Currently President, Ont. Assoc. of Public Health Dentistry)

Branford Experimental Results Reported Flawed…1959-60



FLUORIDATION

Errors and Omissions in Experimental Trials

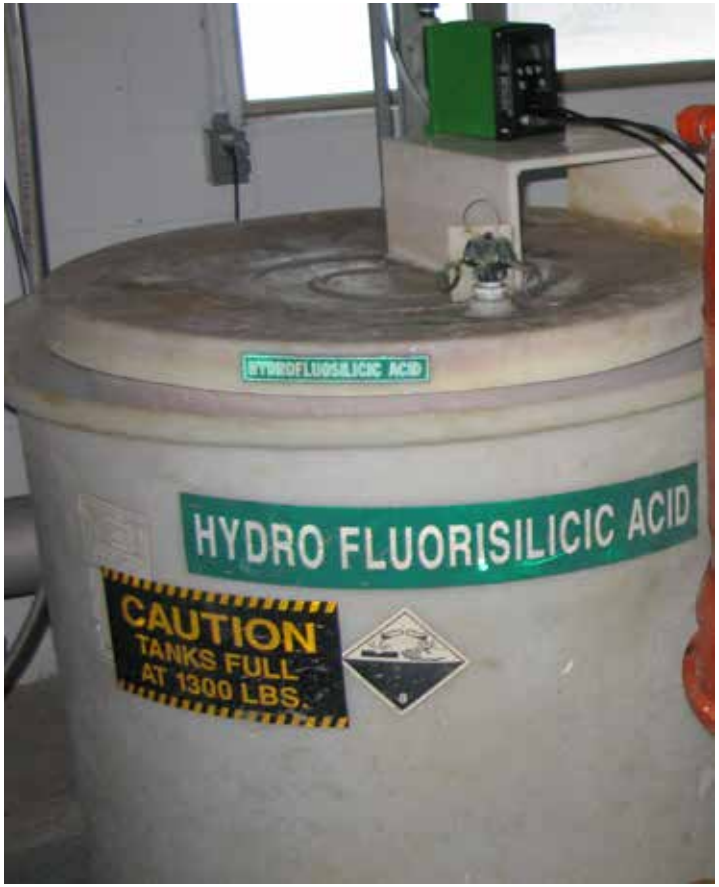
PHILIP R. N. SUTTON

D.D.Sc. (Melb.), L.D.S. (Vic.)

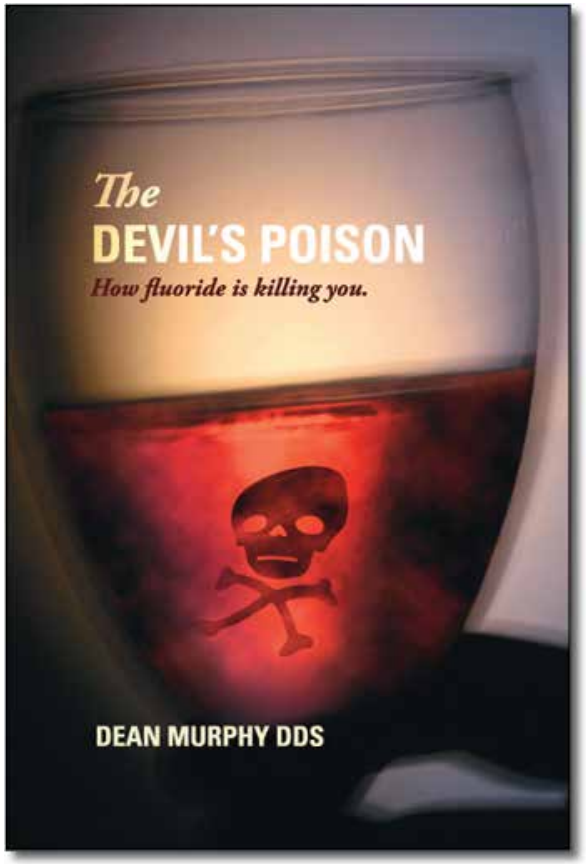
Senior Research Fellow, Department of Oral Medicine and Surgery
Dental School, University of Melbourne

MELBOURNE UNIVERSITY PRESS

“Silicofluoride compounds” have been used as *equivalent* since ~ 1957



Silicofluoride Toxicity

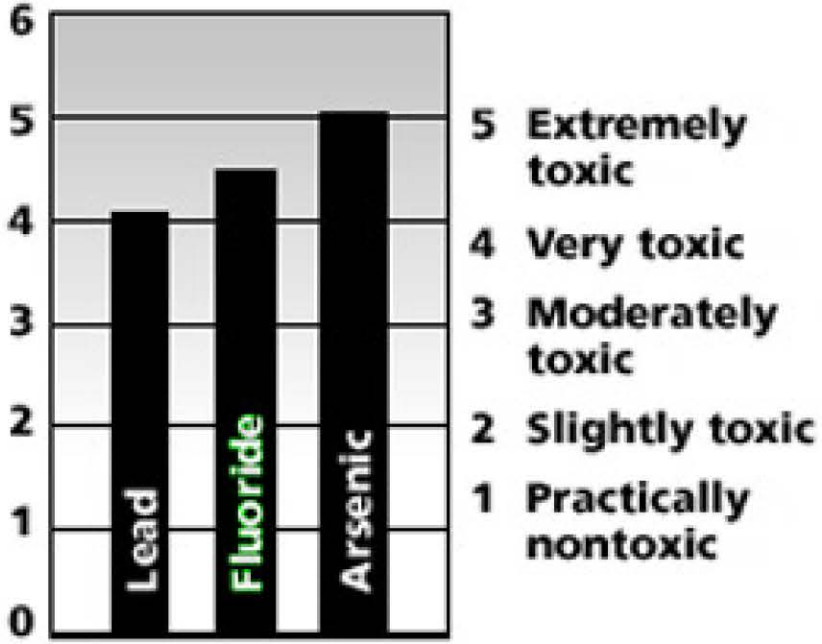


"Small chronic doses of **fluoride**, like **arsenic** and **lead**, accumulate in our bodies causing more disease and deaths than any other substance known to mankind."

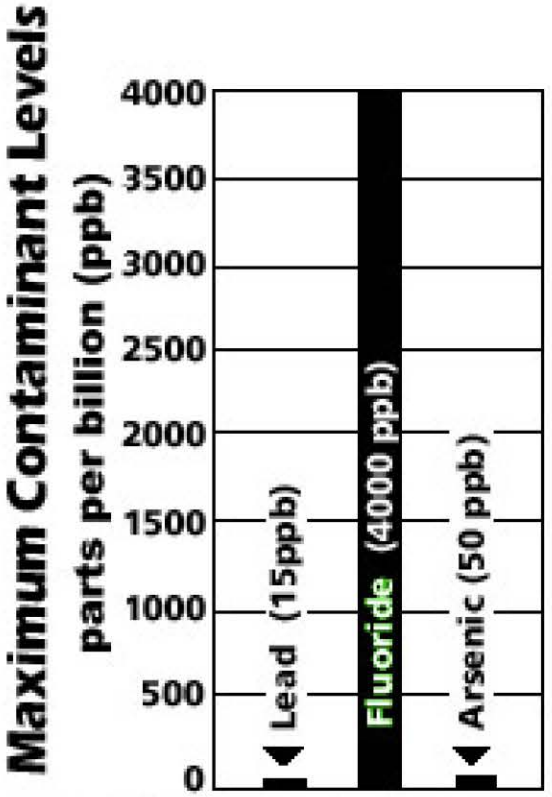
Dr. Dean Murphy, DDS 2008

A comparison between the toxicity and maximum contaminant levels of lead, fluoride and arsenic

Relative Toxicity

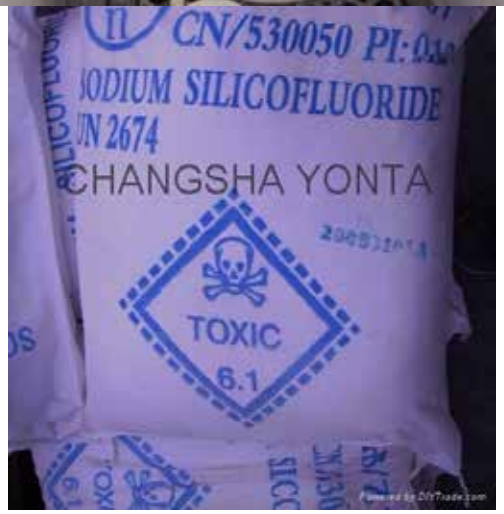


Based on LD50 data from Robert E. Gosselin et al, Clinical Toxicology of Commercial Products 5th ed., 1984



Standards established by the U.S. Environmental Protection Agency

Silicofluoride Compounds



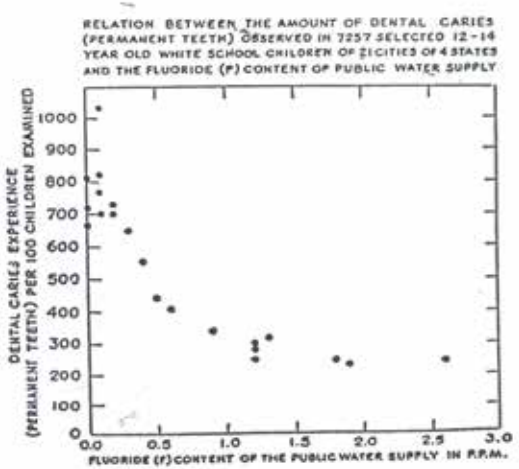
Liquid or granular solids of waste scrubber liquors containing, lead, arsenic and radionuclides.

Never tested for human safety when ingested by HC, MOE, NSF or AWWA

Never proven effective for decay prevention when ingested.

More fluoridation flaws…

In 1960, Dr. H.T. Dean admitted under oath his original studies were <u>methodologically flawed, making the conclusions no longer tenable.</u>



Ingested fluoridation flawed, Dr. R. Ziegelbecker **proof 1981**

"The prevalence of dental caries… shows no relationship with the concentration of fluoride."

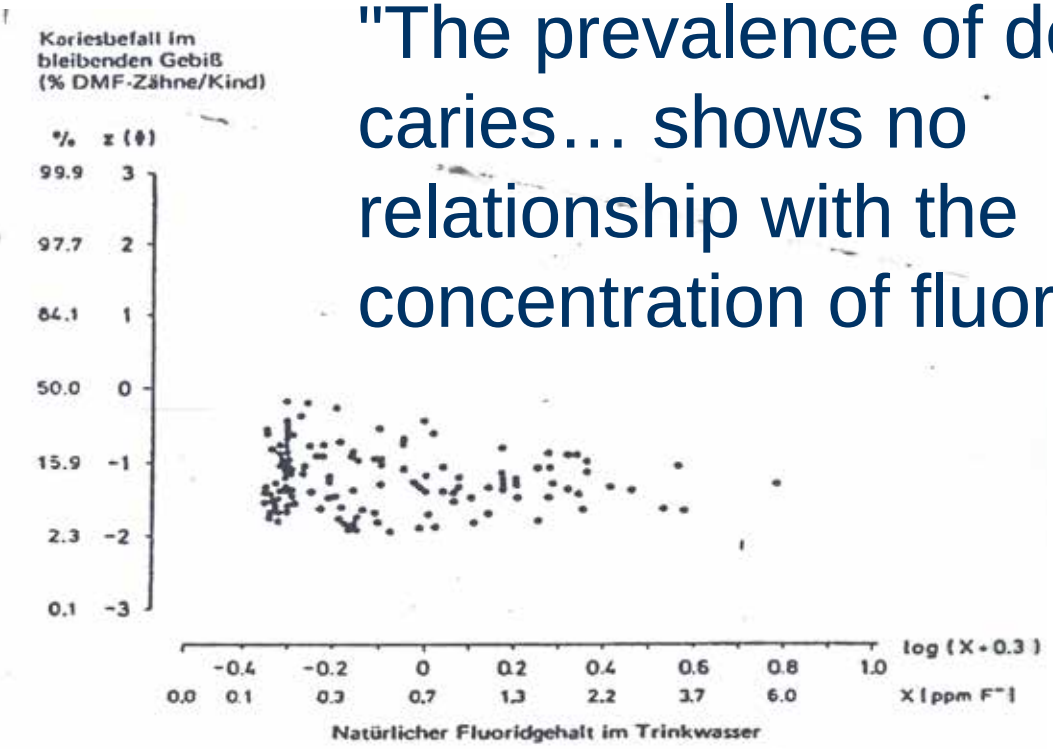


Figure 3 Dental caries and natural water fluoride. Data obtained from all known published studies in North America and Europe including Dean's 21 cities, showing no correlation. From Ziegelbecker (35)

Ontario FOI Requests May 25, 2009

- Fluoridated municipalities, 9 million people
- 17 specific requests for records/submission
- **NO records proving any silicofluorides safe for human ingestion.**
- **NO records proving ingested silicofluorides are effective for decay prevention.**
- Records exist of opinions, endorsements of fluoridation as a “policy.”

Water Fluoridation

(Tune – Daisy, Daisy)

Chorus

Tooth decay, tooth decay
What are we going to do?
It's a **health** issue
It matters to me and you.

1. We know that brushing is helpful
   So do it twice a day
   Eat fruit and veggies ---- get your protein
   Go outside to play! **Chorus**

2. We don't want drugs in the water
   So please don't fluoridate!
   Protect our health, protect the fish
   For it's really not too late! **Chorus**

3. Fluoridation may lower IQ
   Cause cancer ---- brain damage too
   Brittle bones and fractured hips
   It's really up to you.

Chorus

Tooth decay, tooth decay
What are YOU going to do?
It's a **health** issue
NOW IT'S UP TO YOU! (Speak)

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Saturday, March 03, 2012 10:23 AM
To: JASON COVEY
Subject: Fw: Presentation - Open House on Fluoridated Water

Hi Jason,

Here is the final full presentation which the Raging Grannies presented at the Forum on February 29, 2012. Thanks for including this.

Colleen O'Neill

Fluoridation of Orillia's Drinking Water
Public Forum, Orillia February 29, 2012
Presentation by the Raging Grannies
Contact: Colleen O'Neill 705 686 7457

We ask the Council of the City of Orillia not to fluoridate Orillia's water. Exercise due diligence, say NO to fluoridation.

We empathize with members of Council. You have been put in the very unfair position of deciding on the controversial issue of forcing a drug on all people in Orillia; a medical doctor is not permitted to do that, nor to a single patient.

Great Lakes United reports that "Environment Canada ... state(s) that the chemicals used in artificial water fluoridation are hazardous waste which may not be put directly into lakes, rivers and oceans". (Attachment #3) Orillia's sewage treatment plant discharges into Lake Simcoe. We must protect our lakes. ("Great Lakes Water Quality Agreement of 1978" between Canada and the US.)

Fluorosilicic acid, commonly used to fluoridate water, is industrial hazardous waste. It is corrosive, can etch glass, destroy metal pipes. The Certificate of Analysis, accompanying the shipment of fluorosilicic acid to Toronto, sent from the fertilizer plant in Florida, reveals the presence of lead and 40.75 ppm arsenic. (Attachment #4) Who would recommended we drink any amount of this hazardous waste especially when it accumulates in our bones, teeth and brains?

Our deep concern is for babies and young children. A non breast-feeding baby will be put at great risk. The level of fluoride allowed in Ontario's fluoridated water is 175 times that of fluoride found in mother's milk. (Connett, P., Presentation, Feb.17, 2012, Orillia). Fluorosis of the teeth is not a trivial matter and must not be taken lightly. It is a manifestation of systemic fluoride poisoning. ("The Case Against Fluoride" Paul Connett et al, p.114.) Other biological systems will be affected in our babies. We know that not one, single biological process needs fluoride. Many biological processes are harmed by fluoride. (Connett, P. Presentation Feb 17, 2012, Orillia)

The Journal of the Canadian Dental Association advises that "fluoride supplements should not be recommended for children less than 3 years old." (Journal CDA April 1993) Since these supplements contain the same amount of fluoride as found in water, they are basically saying that children under the age of 3 shouldn't drink fluoridated water at all. (Townsend Letter, Nov. 2010). Health Canada recommends "never give fluoridated mouthwash or mouth rinses to children under six years of age as they may swallow it." (hc.sc.qc.ca) Fluoridated tooth paste warns not to swallow. That 'pea-sized' amount is what is in a glass of water.

There is no doubt that Community Water Fluoridation has been a very controversial issue for several decades. Currently, we were quite startled to find over 1/4 million sites on the internet about lawsuits on fluoridated water. (Google - fluoridated water lawsuits)

The weight of scientific evidence indicates a possible relationship between fluoride and serious health effects. ("The Case Against Fluoride" Paul Connett et al,) Promoters of Community Water Fluoridation say it does not CAUSE these effects. (Dr. C. Gardner, MOH, Simcoe County District Health Unit, letter dated January 24, 2012) Where are the peer-reviewed, published studies to prove that?

Councillors, a decision must be made on the side of caution.

A very significant, multi-million dollar, peer-reviewed, published study, funded by the U.S. National Institutes of Health (Warren 2009) found NO relation between ingesting fluoride and tooth decay! (fluoridealert.org) The Centers for Disease Control and Prevention reports that the effectiveness of fluoride is mainly topical rather than through ingestion. (fluoridealert.org)

Instead of Community Water Fluoridation, public money could be spent to help directly those children and families in need of adequate nutrition and dental hygiene.

Dr. Cooney, Dr. Gardner, when we hear you say the things you are saying, when we hear you giving only one side of the story, and we hear you promoting fluoridated water when it flies in the face of common sense and the weight of peer-reviewed, published scientific evidence, quite frankly, gentlemen, you lose your credibility and we lose our trust in you. We think civil servants should not be giving the citizens propaganda. Where is the peer-reviewed, published scientific evidence that Community Water Fluoridation is safe? Fluoridated water has never been proven safe. (Townsend Letter, Nov. 2010) The safety of fluorosilicic acid has never been tested nor approved by the FDA (Townsend Letter, January 2011) nor by Health Canada.

Significantly, the dose of fluoride delivered to each individual cannot be controlled - we drink different amounts of water. People consume fluoride from other sources, - bathing in it, food and beverages processed with fluoridated water (Kiritsy 1996; Heilman 1999), fluoridated dental products (Bentley 1999; Levy 1999), mechanically deboned meat (Fein 2001), tea (Levy 1999) and pesticide residues on food (Stannard 1991; Burgstahler 1997). (fluoridealert.org)

It is unethical to mass medicate Orillia's population.

The Council of Canadians is opposed to CWF. (Attachment #2)
The Canadian Association of Physicians for the Environment, (CAPE) opposes CWF saying: "On the basis of this 'weight of evidence' we believe that fluoridation of drinking water is scientifically untenable, and should not be part of a public health initiative or program." Sept 2008 (Attachment #1)

We need a public debate.

In closing, we ask again that members of Council make their decision on the side of caution, exercise due diligence, protect our water and say NO to adding toxic substances to Orillia's water.

NO RISK IS ACCEPTABLE WHEN ALTERNATIVES ARE AVAILABLE.

Recommended References

1. www.fluoridealert.org

2. “The Case Against Fluoride: How Hazardous Waste Ended Up in Our Drinking Water and the Bad Science and Powerful Politics That Keep It There”, by Paul Connett PhD (Chemistry); James Beck Md, PhD; H.S. Micklem DPhil; Chelsea Green Publishing Company, 2010.
3. Townsend Letter - townsendletter.com

Attachments

1. Policy Statement - Canadian Physicians for the Environment
2. Policy Statement - Council of Canadians
3. Policy Statement - Great Lakes United
4. Certificate of Analysis, Mosaic, provided with the shipment of fluorosilicic acid to Toronto from Florida, 2007.

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Tuesday, February 28, 2012 11:47 AM
To: JASON COVEY
Subject: fluoridation Forum
Importance: High

Hi Jason,

Below are the talking notes for the Raging Grannies' presentation. We have had to make cuts to that which I set in last Friday. (Too long-winded!)

We'll be singing the song before the presentation. Also, would it be possible to display the Certificate of Analysis near the beginning of the presentation?

Thanks so much, Jason. See you tomorrow!

Colleen

Presentation by the Raging Grannies
Contact Colleen O'Neill colleenc@amtelecom.net
Public Forum on Community Water Fluoridation
City of Orillia
February 29, 2012

1. Introduction
2. Fluorosilicic acid - classification
3. Young Children
4. Controversial Issue; discussion
5. Studies - NIH, CDC
6. Dose
7. Council of Canadians
8. CAPE
9. Closing

Canadian Association of Physicians for the Environment

Statement on drinking water fluoridation

The Canadian Association of Physicians for the Environment (CAPE) does not support fluoridation of drinking water for the following reasons.

1) The decline in caries in communities that are fluoridated has been highly significant -- but so has the decline that has occurred in non-fluoridated communities. There has, in fact, been a general decline in dental caries throughout the Western world, and the decline in fluoridated cities has not exceeded that in non-fluoridated communities. For example, BC drinking water is 95% non-fluoridated, whereas drinking water in Alberta is 75% fluoridated; yet the two provinces have similar rates of caries. Furthermore, Europe is 98% non-fluoridated, but global European dental health is generally equivalent to or better than that in North America. Whatever the reason for the decline in dental caries, it can not be concluded that it is the result of drinking water fluoridation.

2) The incidence of toxic effects in humans from fluoridation may well have been underestimated. The most serious potential association is with osteosarcoma in boys, which appears to have been loosely associated with age of exposure to fluoride. It is true that the CDC has (as has the original researcher) acknowledged that current data are tentative, but a further larger-scale study is pending from the Harvard School of Dentistry. At the very least, such data are grounds for caution.

3) Animal studies have shown a wide range of adverse effects associated with fluoride. It has been shown to be a potential immunotoxin, embryotoxin, neurotoxin and harmful to bony tissues, including both dental and ordinary bone. In addition, it can damage (inhibit) thyroid function in several species, including humans. Its effect on ecosystem balance has been little researched, but is unlikely to be positive.

4) The intake of fluoride from drinking water is uncontrolled, and can lead to dental fluorosis in children who are inclined to drink large amounts of water. Both natural and artificially flouridated water can cause this effect, which is, of course, simply a visible representation of an effect on the entire bony skeleton. The cost of repairing teeth damaged by fluorosis is not trivial; moderate to severe effects can require $15,000 or more in dental fees.

It seems clear that a) fluoridation is unlikely to be the cause of the decline in caries in Europe and North America b) the potential for adverse effects is real, and c) current evidence points in the direction of caution. Over the last decade, recommendations with respect to acceptable fluoride exposure have steadily declined, and cautions have increased. Any dental benefit that may accrue from fluoride exposure is fully achieved by controlled topical application of fluoride compounds by trained dental professionals, not by fluoride ingestion. [The analysis of Dr. Hardy Limeback (www.fluoridealert.org/limeback.htm), Head, Preventive Dentistry, at the University of Toronto, further clarifies these points.]

On the basis of this "weight of evidence" we believe that fluoridation of drinking water is scientifically untenable, and should not be part of a public health initiative or program.

Sep-08

"The Council of Canadians is opposed to the fluoridation of drinking water. We are concerned by the health and environmental impacts associated with it."

9. Fluoride

Received August 22, 2011

Submitted by Toronto Chapter, ON. Passed at AGM Oct.23, 2011.

Whereas municipal drinking water borrowed from and returned to the environmental water commons should meet a continuum of quality, ethical purpose and sustainability both coming and going;

Whereas artificial water fluoridation is a practice whereby municipalities can add fluoride to their own drinking water but have no corresponding accountability for putting that fluoride into the downstream water commons via treated waste water;

Whereas there are two guidelines for fluoride: Health Canada's narrow-focused one of 0.7 mg/L for *increased* fluoride in municipal water, infringing on the sustainability of the water commons with a Canadian Water Quality guideline *limit* of 0.12 mg/L;

Whereas neither fluoride guideline is regulatory, but the Canadian Water Quality Guideline of 0.12 mg/L protects both human health and aquatic species and therefore should be observed; but the Health Canada guideline does not protect the health of several vulnerable groups including babies, and harms aquatic species;

Whereas the chemicals used to *increase* fluoride in municipal water to reach the Health Canada guideline, hydrofluorosilicic acid or sodium silicofluoride are *not* regulated by Health Canada at all, but *are* regulated by Canadian Environmental Protection Agency as Class 1 cumulative, persistent, hazardous toxins that *must not be emitted* to the environmental commons of soil, air or surface water at all;

Whereas anyone is free to decide to take fluoride drugs that Health Canada has approved and regulated, or food and drink with naturally occurring fluoride, without adding restricted fluoride pollutants to drinking water and the downstream water commons;

Therefore, be it resolved that the Council of Canadians provide national leadership towards a policy of drinking water quality regulation that disallows water fluoridation, based on Canadian Water Quality Guideline for fluoride in the environmental commons.

Great Lakes United
Union St-Laurent Grands Lacs

An international coalition to protect and restore the Great Lakes and St. Lawrence River

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Resolution regarding artificial water fluoridation

Whereas the Basel Convention, Environment Canada and United States Environmental Protection Agency (US EPA) all state that the chemicals used in artificial water fluoridation are hazardous waste which may not be put directly into lakes, rivers and oceans; and,

Whereas artificial water fluoridation chemicals contain between 20 to 30% hydrofluorosilicic acid (inorganic fluoride), trace amounts of arsenic, lead, mercury, radionuclides and other heavy metals, all considered to be toxic substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Priority List of Hazardous Substances in USA, 1989 First Priority Substances lists in Canada and proposed for "virtual elimination" under the Canadian Environmental Protection Act, the 1997 Binational Toxic Strategy and the 1978 Great Lakes Water Quality Agreement; and,

Whereas fluoride is not removed in sewage treatment and remains a toxic constituent of the effluent discharged by treatment plants to rivers and lakes; and,

Whereas background levels of fluoride in the Great Lakes exceed the Canadian Water Quality Guideline (CWQG) and fluoride concentrations in sewage effluent are 5-10 times in excess of the CWQG. At these concentrations fluoride is known to be toxic to a variety of water species such as salmon, caddisfly, daphnia magna & others; and,

Whereas the US EPA labor unions, the Canadian Association of Physicians for the Environment (CAPE), and professionals world-wide state that artificial water fluoridation is not effective in the prevention of cavities and not safe to vulnerable populations, as demonstrated in the recent US National Research Council 2006 Review; and,

Whereas there is a wide range of health vulnerabilities in a population and a wide range of consumption patterns for fluoridated water and beverages and foods made with fluoridated water, which means that an individual's daily dose of fluoride chemicals from drinking water cannot be controlled;

Whereas imposing chemicals used as a medication to a population without a prescription or their informed consent is unacceptable; and,

Whereas less than one percent of treated water is actually ingested by the body and the remaining 99 percent put into the environment; and,

Therefore be it resolved that Great Lakes United supports statements by the United States Environmental Protection Agency labor unions, Canadian Association of Physicians for the Environment (CAPE), and professionals wordwide that the practice of artificial drinking water fluoridation be terminated; and,

Therefore be it further resolved that Great Lakes United works to reverse existing government policies supporting artificial drinking water fluoridation;

Therefore be it further resolved that Great Lakes United supports government policies, practices and regulations which do not permit drinking water to be used as a means of delivery for chemicals or drugs intended to treat humans – for example, the chemical called hydrofluorosilicic acid, used to deliver fluorides;

Therefore be it further resolved that Great Lakes United supports government policies, practices and regulations requiring fluoride polluting industries to dispose of this hazardous waste in a safe, sustainable manner which does not harm our ecosystem;

Therefore be it further resolved that Great Lakes United communicates accurate information regarding the safety and efficacy of these artificial fluoridation chemicals to municipal associations (such as the Federation of Canadian Municipalities), the Great Lakes-St. Lawrence Cities Initiative, First Nations and Tribal Governments who are attempting to make informed decisions on this issue;

Therefore be it further resolved that Great Lakes United makes their position known to provincial, state and federal governments.

I hereby certify that this is a true copy of a resolution adopted at the twenty-seventh annual meeting of Great Lakes United on May 20, 2009.

Julie L. O'Leary

Julie O'Leary
President

8813 Hwy 41 South
Riverview, FL
Telephone: (813) 677-9111 - TELX52668
Fax: (813) 671-6283 ACCOUNTING

This product was produced at the Production Plant - Riverview facility

CAR NO: SHPX204535

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Material: Our / Your reference
200011 Fluorosilicic Acid /

Quality Certificate
Date
09/05/2007
Purchase order item/date
60904702 / 09/05/2007
Delivery item/date
1000189122 000010 / 09/05/2007
Order item/date
1068836 000010 / 09/05/2007
Customer number
4001135

Inspection lot 100000010461 from 09/05/2007

Characteristic	Result	Unit
Chemical Analysis		
Net H2SiF6	24.69	%
P2O5	0.28	%
Free Acid	0.35	%
Lead	< 1.00	ppm
Arsenic	40.75	ppm
Physical Analysis		
Density	1.2190	
APHA	40	

NSF

Kwasi Sakyi-Amfo
QC Lab Supervisor - Riverview

From: Colleen O'Neill [mailto:colleenc@amtelecom.net]
Sent: Friday, February 24, 2012 3:28 PM
To: JASON COVEY
Subject: Presentation - Open House on Fluoridated Water
Importance: High

Hi Jason,

Here is the presentation for the Raging Grannies for the Forum. There is another attachment which I shall send in another email. (I still am not that proficient on computers.) Thanks.

I understand that Kelly Clune sent you the words to the song we shall be singing. Thank you for projecting the words for us.

Please let me know if you receive this.

Thanks again.
Colleen O'Neill

Presentation by the Raging Grannies
to the Orillia Public Forum on Fluoridation
February 29, 2012

Contact: Colleen O'Neill colleenc@amtelecom.net

uoridation of Orillia's Drinking Water

We are here to ask the Council of the City of Orillia not to fluoridate Orillia's drinking water. We ask you to protect our water which is so necessary for life. Just say NO to fluoridation.

We empathize with members of Council. You have been put in the unfair position of having to make a decision on the very controversial issue of administering a medication to all people in Orillia when even our doctors are not permitted to do that.

Our deep concern is for the babies and young children in our community who would be put at risk. The level of fluoride allowed in Ontario's fluoridated water is 175 times that of fluoride found in mother's milk. (Connett, P., Presentation, Feb.17, 2012, Orillia) And Grannies say, "Mother Nature knows best". A non breast-feeding baby will be at risk of getting fluorosis of the teeth as they mature, which is not a trivial matter and we must not make light of it; it is a manifestation of systemic fluoride poisoning. ("The Case Against Fluoride" Paul Connett et al, p.114.) Other biological systems will be affected in our babies. We know that not one single biological process needs Fluoride. Many biological processes are harmed by Fluoride. (Connett, P. Presentation Feb 17, 2012, Orillia)

There are excellent resources available for good information on fluoridated water. "The Case Against Fluoride: How Hazardous Waste Ended Up in our Drinking Water and the Bad Science and Powerful Politics That Keep It There" by Dr. Paul Connett and others, which includes 80 pages of references; the web site fluoridealert.org.; The Townsend Letter, (townsendletter.com); The Council of Canadians, (Attachment # 2); The Canadian Association of Physicians for the Environment, (Attachment #1); and Great Lakes United (Attachment #3) to mention a few.

There is no doubt that fluoridating a community's drinking water has been a very controversial issue for several decades. In 1946, Dr. James Sumner, Nobel prize winner for work on enzyme chemistry, a well-known scientist opposing water fluoridation, is quoted as saying: "We ought to go slowly. Everybody knows that fluorine and fluorides are very poisonous substances and we used them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned because the enzymes are poisoned and that is why animals and plants die."
(Connett, P., Presentation Feb 17, 2012, Orillia; "The Case Against Fluoride", Connett et al, p.117)

Many studies throughout the world indicate a possible relationship between fluoride and serious health effects including bone cancer, brittle bones, hip fractures in the elderly, lowered IQ, arthritis, impaired kidney function, brain damage, reproductive problems. ("The Case Against Fluoride" Paul Connett et al,)
Promoters of Community Water Fluoridation claim water fluoridation does not CAUSE these effects. (Dr. C. Gardner, MOH, Simcoe County District Health Unit, letter dated January 24, 2012)

When in doubt a decision must be made on the side of caution.

Let us look at just one, very significant study, the first of its kind, which looked at the relationship between fluoridation of drinking water and tooth decay. The U.S. National Institutes of Health, one of the world's foremost medical research centres, an Agency of the US Department of Health, funded a multi-million dollar study (Warren 2009). This study found NO relation between drinking fluoridated water and tooth decay. NO relation between drinking fluoridated water and tooth decay! (fluoridealert.org) This was the first time that tooth decay had been investigated as a function of individual exposure as opposed to merely living in a fluoridated community.

The Centers for Disease Control and Prevention reports that the effectiveness of fluoride is topical rather than through ingestion. (fluoridealert.org) In other words, fluoride is used to prevent tooth decay by applying it to the teeth, not swallowing it. Just look at the warning "DO NOT SWALLOW" on fluoridated tooth paste packaging. By the way, the amount of fluoride in a pea-sized amount that children should not swallow, is equal to the amount of fluoride in a 250 ml glass of fluoridated water intended for Orillia's people. It would be very unwise to put this into everyone's drinking water, wouldn't it!

Since 1. there is no relation between drinking fluoridated water and tooth decay and 2. since fluoride's effectiveness is topical treatment rather than through ingestion, then why would any community spend thousands of dollars to fluoridate its water supply? This public money could be spent to help directly those children and families in need of adequate nutrition and dental hygiene.

Community fluoridated water goes to everyone, regardless of age, need, and vulnerability. The dose of fluoride delivered to each individual cannot be controlled. Some people may not drink water, while others may drink too much. Some people are more vulnerable to its effects, for example, babies, those on dialysis or with weak kidneys, those with a poor diet. People consume fluoride, from other sources, too, such as food, beverages processed with fluoridated water (Kiritsy 1996; Heilman 1999), fluoridated dental products (Bentley 1999; Levy 1999), mechanically deboned meat (Fein 2001), tea (Levy 1999) and pesticide residues (e.g., from cryolite) on food (Stannard 1991; Burgstahler 1997). (fluoridealert.org)

Are there studies to show if fluoride is absorbed through the skin while bathing or showering in fluoridated water? We know that in the case of a closely related chemical, chlorine, that more chlorine is absorbed through the skin through daily bathing or showering in chlorinated water than through normal drinking of that water.

AND - all this fluoride accumulates in our bodies.

We believe it is unethical to fluoridate Orillia's drinking water.

According to Dr. Arvid Carlsson, the 2000 Nobel Laureate in Medicine and Physiology, "Water fluoridation goes against leading principles of pharmacotherapy which is progressing... to a much more individualized therapy as regards both dosage and selection of drugs. The addition of drugs to the drinking water means exactly the opposite of an individualized therapy."
(Quoted in "50 Reasons to Oppose Fluoridation" by Paul Connett, PhD, James Beck, MD, PhD, Michael Connett, JD, Hardy Limeback, DDS, PhD, David McRae, Spedding Micklem, D. Phil. (www.fluoridealert.org)

We are aware that great effort has been made to improve the health of Lake Simcoe. Orillia's water supply is discharged into Lake Simcoe. The B.C. Ministry of the Environment has reported that "fluoride ions are directly toxic to aquatic life, and accumulate in the tissues. " (www.ene.gov.bc.ca) Orillia's sewage treatment plant discharges into Lake Simcoe. How expensive will it be to remove fluoride from fluoridated water before discharging it into Lake Simcoe? Is it even possible?

Fluoride is not the only toxic substance found in artificially fluoridated water. Among other toxic substances, for example, 40.75 ppm of arsenic has been documented in the additives used to fluoridate Toronto's water. Certificate of Analysis, Mosaic, 2007 - Attachment #4

Great Lakes United reports that "the Basel Convention, Environment Canada and the US Environmental Protection Agency all state that the chemicals used in artificial water fluoridation are hazardous waste which may not be put directly into lakes, rivers and oceans". (Attachment #3)

The Canadian Association of Physicians for the Environment (CAPE) after reviewing the literature makes the following statement: "On the basis of this "weight of evidence" we believe that fluoridation of drinking water is scientifically untenable, and should not be part of a public health initiative or program."
Sept 2008 (Attachment #1)

In closing, we ask again that members of Council make their decision on the side of caution and say NO to fluoridating Orillia's water.

NO RISK IS ACCEPTABLE WHEN ALTERNATIVES ARE AVAILABLE.

Recommended References

1. www.fluoridealert.org
2. "The Case Against Fluoride: How Hazardous Waste Ended Up in Our Drinking Water and the Bad Science and Powerful Politics That Keep It There", by Paul Connett PhD (Chemistry); James Beck Md, PhD; H.S. Micklem DPhil; Chelsea Green Publishing Company, 2010.

Attachments

1. Policy Statement - Canadian Physicians for the Environment
2. Policy Statement - Council of Canadians
3. Policy Statement - Great Lakes United
4. Certificate of Analysis, Mosaic, provided with the shipment of fluorosilicic acid to Toronto from Florida, 2007.

Mayor Orsi, Members of the Orillia City Council, Members of the Orillia Community.

I thank you for the opportunity to give my presentation tonight.

My name is Tammy Gouweloos, I am a registered dental hygienist, providing dental hygiene care for over 30 years, more than half of that time in the city of Orillia.

I am also a Past President of the Ontario Dental Hygienists Association and past Vice-president of the Dental Hygiene Practitioners of Ontario. I am currently on the Board of the International Academy of Biological Dentistry and Medicine and a student to become a Nutrition Practitioner.

I have come to several conclusions as to why Orillia has a higher rate of decayed teeth in our children. It has nothing to do with whether or not we have fluoride in our water.[1]

For example, BC drinking water is 95 percent non-fluoridated, whereas drinking water in Alberta is 75 percent fluoridated; yet the two provinces have similar rates of decayed teeth. Furthermore, Europe is 98 percent non-fluoridated, but global European dental health is generally equivalent to or better than that in North America. Whatever the reason for the decline in decayed teeth, it cannot be concluded that it is the result of drinking water fluoridation.[2]

The high amount of decayed teeth everything to do with the state of health of our young families. Dental decay is a disease that is completely preventable without public water fluoridation. An increase in dental decay is being seen all over North America, not just in Simcoe County, not just in Orillia.

Dental decay is caused by nutritional deficiencies: excess sugar, acidic foods and drinks and fermentable carbohydrates. Nutritional education is the key to prevention.

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[1] Kalsbeek H, Verrips GHW. Dental Caries and the use of fluorides in different European countries. *J Dent Res 1990;69(special issue):728-732.*

[2] Canadian Association of Physicians for the Enviroment, An official Word on Drinking Water Fluoridation, July 15, 2010

Orillia has a high number of low-income families and families on benefit programs, which is directly connected to higher rates of dental decay. Dental decay is also caused by lack of early, accessible and affordable oral care. [3]

Dental decay is caused by the same nutritional deficiencies that are responsible for the higher rates of obesity, diabetes, allergies and asthma in the same young families.

During my 16 years of providing dental hygiene care to Orillia families, there was great evidence of dental fluorosis. Dental fluorosis an abnormal discoloration and a change in the matrix of the enamel. This irreversible and disfiguring condition is caused by too much fluoride. I would predict between 20-30 % of children, teens and young adults in our community have this condition.

Children, now and in previous years are receiving excess fluoride. Fluoride is present in toothpastes, mouthwashes, through consuming juices and drinks made with fluoridated water, and from pesticides and fluoridated water that are sprayed on fruits and vegetables.

Fluoridated water in Orillia will double the amount of dental fluorosis; we would see 50-60%.

Dr. Cam McLean, who is he Head of the Dental Study Group in Calgary, stated that with fluoridation “the percentage of fluorosis that we see in our practice ranges from 35-60%.” Calgary no longer has water fluoridation.

Who is going to pay to repair these disfigured teeth?

Québec City Council voted on April 1, 2008, to discontinue fluoridating its drinking water. On January 24, 2008, a delegation from People for Safe Drinking Water (PFSDW) convinced Niagara Regional Council not to implement artificial fluoridation at its’ six regional water plants, and to pass bylaws to cease existing fluoridation schemes. On April 14, 2008, Dryden residents voted 87% against drinking water fluoridation. This, after a heated public relations battle that brought into the area.

Region of Waterloo Council voted to turn fluoridation off after 50.3% of the referendum voters decided 'No' to water fluoridation. The fluoridation was turned off November 29, 2010.

Thunder Bay’s City council voted against a resolution to study fluoridating the city’s water supply. The Mayor of Thunder Bay, Lynn Peterson stated, "My issue is 2 million pounds of (flouride) being washed through our system with only one per cent being consumed (by the public), the rest being flushed into the Great Lakes."

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[3] Locker D. Measuring social inequality in dental health services research; individual, household and area-based measures. Community Dental Health, 1993;10(2):139-50. Leake JL. Why Do We Need an Oral Health Care Policy in Canada? J Can Dent Assoc. 2006;72(4);317.

GREAT LAKES UNITED Passes Resolution that Supports the End of Water Fluoridation 2009

Great Lakes United is an international coalition dedicated to preserving and restoring the Great Lakes-St. Lawrence River ecosystem. The coalition is made up of member organizations representing environmentalists, conservationists, hunters and anglers, labor unions, community groups, and citizens of the United States, Canada, and First Nations and Tribes**.**

Their concern is only 1% of treated water is consumed for drinking; the remaining 99% carries the dissolved inorganic fluoride through the wastewater treatment process and straight back into the environment. A survey of annual drinking water reports of eastern Ontario communities shows the levels of fluoride in Lake Ontario and the St Lawrence River increasing and double (0.24mg/L) what the provincial guideline is for the Lake (0.12mg/L). Evidence exists showing that aquatic organisms are harmed and fisheries are at risk.

In 2006, the National Research Council in the United States completed a thorough research of all scientific papers on fluoride and its' effects on the health. Fluoridation of water has been linked to defects and effects to: teeth, bone, hip fractures, muscles, reproductive ability, brain health, behavior, thyroid, intestinal, liver, kidney function and cancer.[4]

No one is keeping track of how much each person swallows. And what about our skin? Dr. M. Nosal at the University of Calgary, determined through a human study, "that the fluoride intake is **doubled** though skin asborption from bathing and showering in fluoridated water. "

It is no longer acceptable to simply rely on endorsements from agencies that continue to ignore the large body of scientific evidence on this matter -- especially the extensive citations in the National Research Council Report discussed above.

A case can be made for topical fluoride use, but not for the ingested variety. Orillia should be leaving the application of fluoride in the hands of the dental professionals.

The untold millions of dollars that are now spent in the US and Canada, on equipment, chemicals, monitoring, and promotion of fluoridation could be much better invested in nutrition education and targeted dental care for children from low income families.

The latest research done in Ontario by the Community Dental Health Department released in 1999, compares the cavity rates of fluoridated and non-fluoridated

[4] National Research Council of the National Academies, Fluoride in Drinking Water: A Scientific Review of the EPA's Standards, 2006

communities. It states the difference “is often not statistically significant and may not be of clinical significance”. Also included in the research states “the current studies of effectiveness of water fluoridation have design weaknesses and methodology flaws”. [5]

Dr. Phyllis Mullenix, a toxicologist who studied fluoride at the Forsyth Dental Centre in Boston, a renowned research centre affiliated with Harvard Medical School for over ten years states, “the 50 years of studies about fluoride safety do not exist. At 1ppm fluoridated will cause permanent neurological damage to children.”

Dental professionals have been educated and have a belief system that fluoridation does the job of preventing cavities. It will be very hard for the dental professionals to accept this: the evidence against water fluoridation is obvious. Most countries and communities all over the world are refusing water fluoridation.

Water fluoridation is based on “old science”. Dental professionals, dental organizations and dental government agencies need to move toward, need to move out of the early 20th century, into the 21st century. New technology and new research is where we need to be directing our energies. New technology is available now with xylitol, nutritional recommendations, probiotics and lytic enzymes to prevent cavities.

I would like to end my presentation by congratulating the previous Councils of Orillia for listening to the people in their community and for not voting to add Fluoride to the Public drinking water of Orillia when it was brought forward in the 1960’s and the 1980’s.

I strongly urge the council to keep our water clean, it is a precious natural resource that should not be tampered with.

Thank you

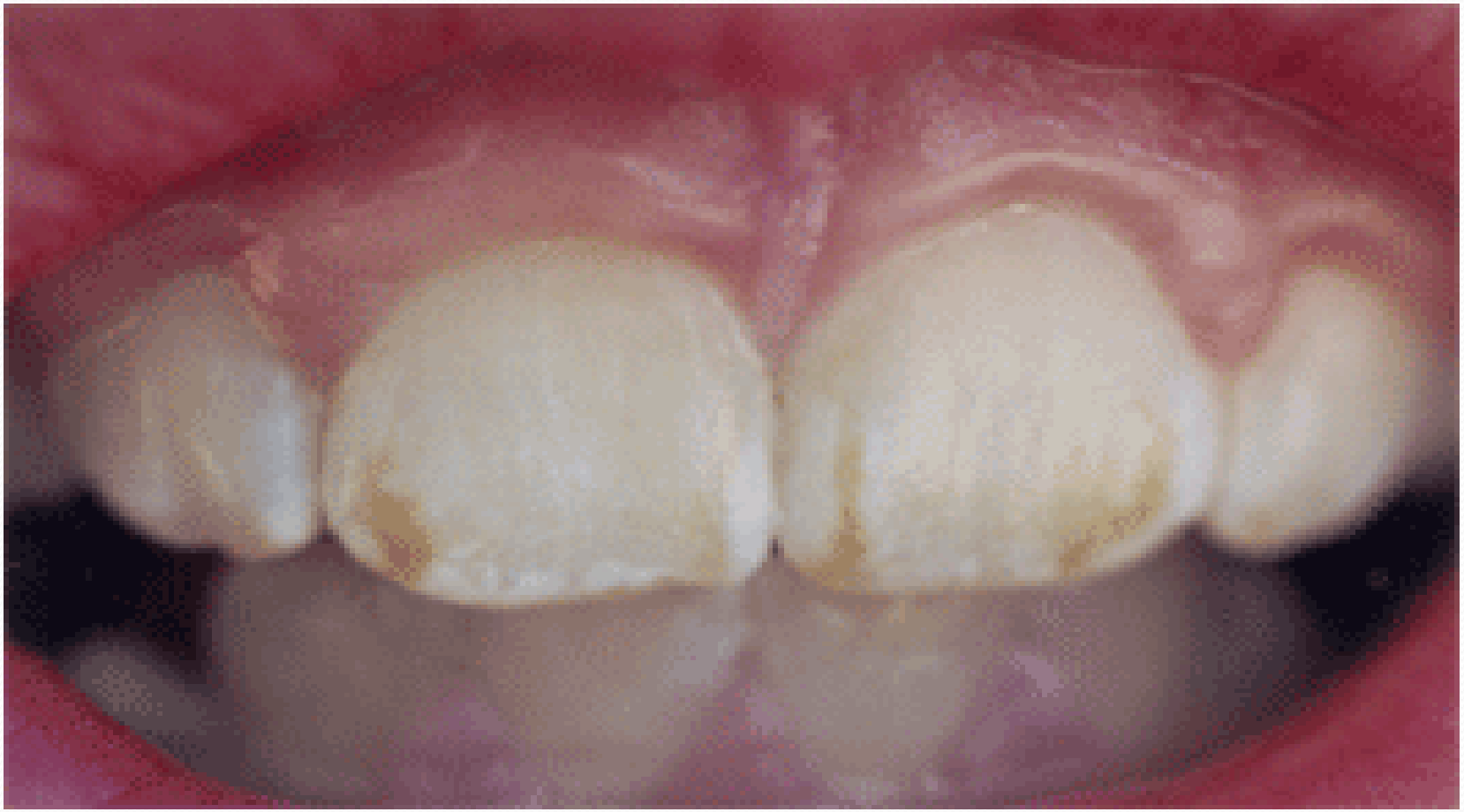
[5] Locker D. Benefits and Risks of Water Fluoridation: An Update of the Federal-Provincial Sub-committee Report, November 15, 1999.

Water Fluoridation

High Decay Rate


BUSH 04
Aspartame
cola
MSG
Fish Filet
Fluoride
Springs
MSG
Burger
Genetically
Altered
SPUDS
Prozac
Deesillustration.com

Dental Fluorosis



Lake Simcoe

Lake Couchiching

Dental Fluorosis

My Fluoride Talk ~ Orillia City Council ~ Public Forum

Good evening. Thank you Mr. Jason Covey and the Orillia Council for providing this space tonight to progress in the direction of health and well being in our community.

My name is Scott Miller. I am a Dalhousie University graduate and an Orillia based business owner. One of the main reasons my business exists is because concerned citizens across Canada want to remove fluoride from their drinking water. My wife and I moved here last summer to be close to our family and want to raise our own children here.

We are very disappointed that Orillia is considering, for a 3rd time, to fluoridate the water supply. For those who are unaware, this has been attempted twice here in the past and fortunately the town councillors of the early 1960s and late1980s were wise enough to say no. Why was that a wise decision?

(http://www.simcoe.com/news/article/1032603--moh-wants-fluoride-in-water)

Here are 5 simple points which will explain:

1) The fluoride that is generally used to artificially fluoridate municipal water is called hydrofluorosilicic acid. It is also known as fluorosilicic acid or hexafluorosilicic acid, and is a pale yellow liquid, both poisonous and corrosive. Again, it is acid. It has the same pH level as battery acid which is 1.2 and is so corrosive it will burn a hole through 1/4 inch of steel in less than hour. While speaking with a couple of employees who have worked with hydrofluorosilicic acid at municipal water works, they told me they hate working with the substance because it is so toxic. They also explained how it literally etches glass in the room.

2) Environment Canada, the United States Environmental Protection Agency and the International Basel Convention all state that the chemicals used in artificial water fluoridation are hazardous waste, a by-product of the fertilizer industry, which may not be put directly into lakes, rivers and oceans. These water fluoridation chemicals contain between 20-30% hydrofluorosilicic acid and trace amounts of arsenic, lead, and mercury. Consider our water commons …fluoride is not removed in sewage treatment and remains a toxic part of the wastewater discharged by treatment plants to our lakes. With all the recent efforts to clean up our lakes, why go backwards?

(Julie O'Leary, President of Great Lakes United)

3) According to the National Science Foundation, the most common contaminant found in hydrofluorosilicic acid is arsenic. Arsenic causes cancer. The World Health Organization, Food and Drug Administration and the Environmental Protection Agency all agree and classify arsenic as "carcinogenic to humans".

http://www.fluoridealert.org/f-arsenic.htm
(http://www.cancer.org)

4) Imposing toxic chemicals used as a medication to a population without a prescription and without their consent is unacceptable and dangerous. To date, Internationally, over 4000 Medical Doctors, Nurses, Dentists, Naturopaths, Lawyers, Pharmacists, and Water Treatment workers have signed a Statement Calling for an End to Water Fluoridation. They all have an abiding interest in ensuring that government public health and environmental policies be determined honestly, with full attention paid to the latest scientific research and to ethical principles.

http://www.fluoridealert.org/professionals-statement.aspx

5) Looking worldwide, 97% of Western Europe, and all of China and India are fluoride free. Looking across Canada 96% of British Columbia and 94% of Quebec are fluoride free. In the past 2 years, 15 municipalities across Canada including Calgary and Waterloo have listened to their citizens and stopped adding fluoride to their water. With all this evidence, and all this progress towards health…. why go backwards Orillia?

http://cof-cof.ca/2011/12/canadas-growing-list-of-communities-rejecting-fluoridation-of-their-drinking-water/

OAPHD

Ontario Association of Public Health Dentistry

Presented to

City of Orillia Council

Public Forum on Fluoridation

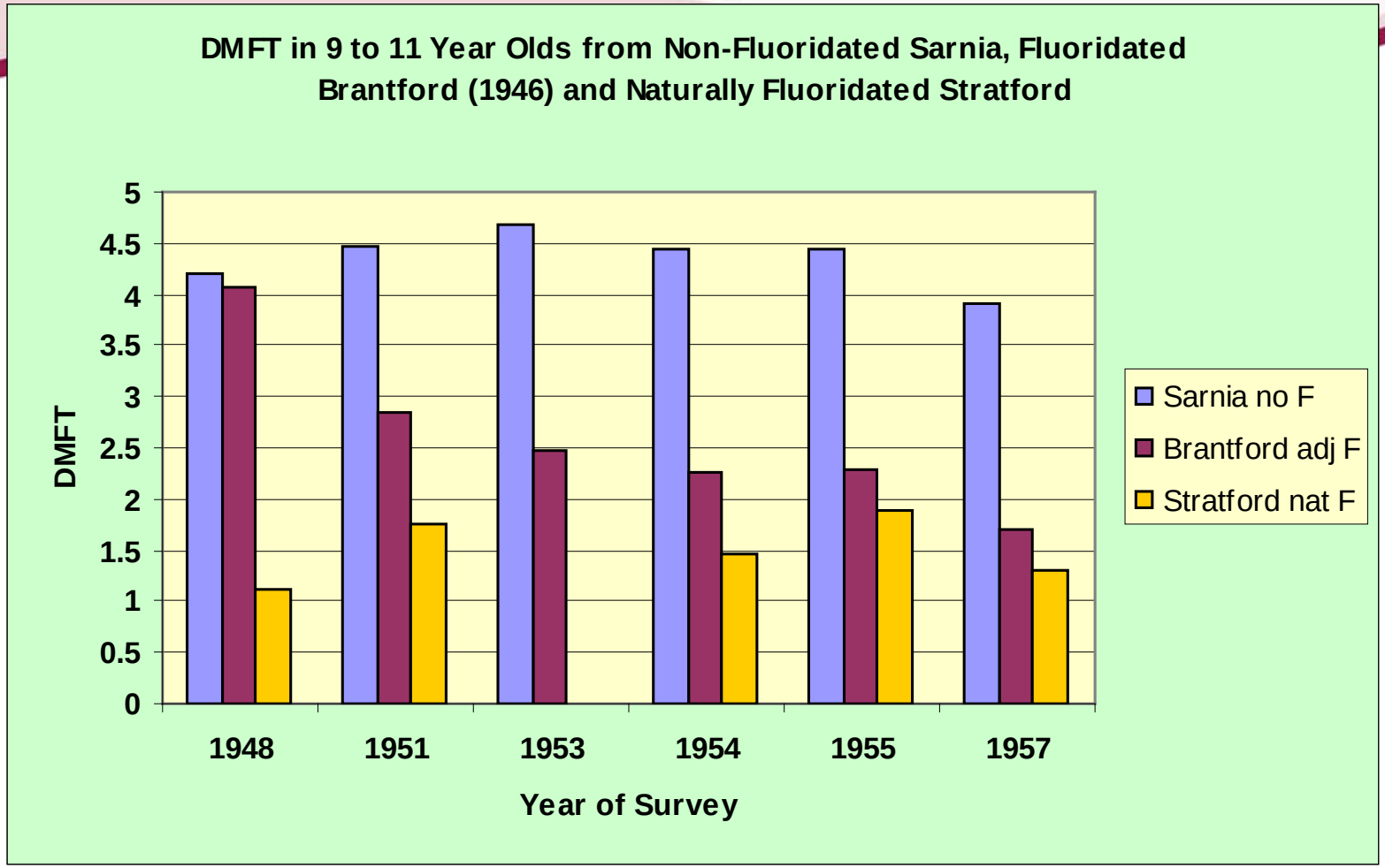
February 29, 2012

Dr. Dick Ito DDS, MSc, FRCD(C)

Past President Ontario Society of Public Health Dentistry

Effectiveness of Community Water Fluoridation

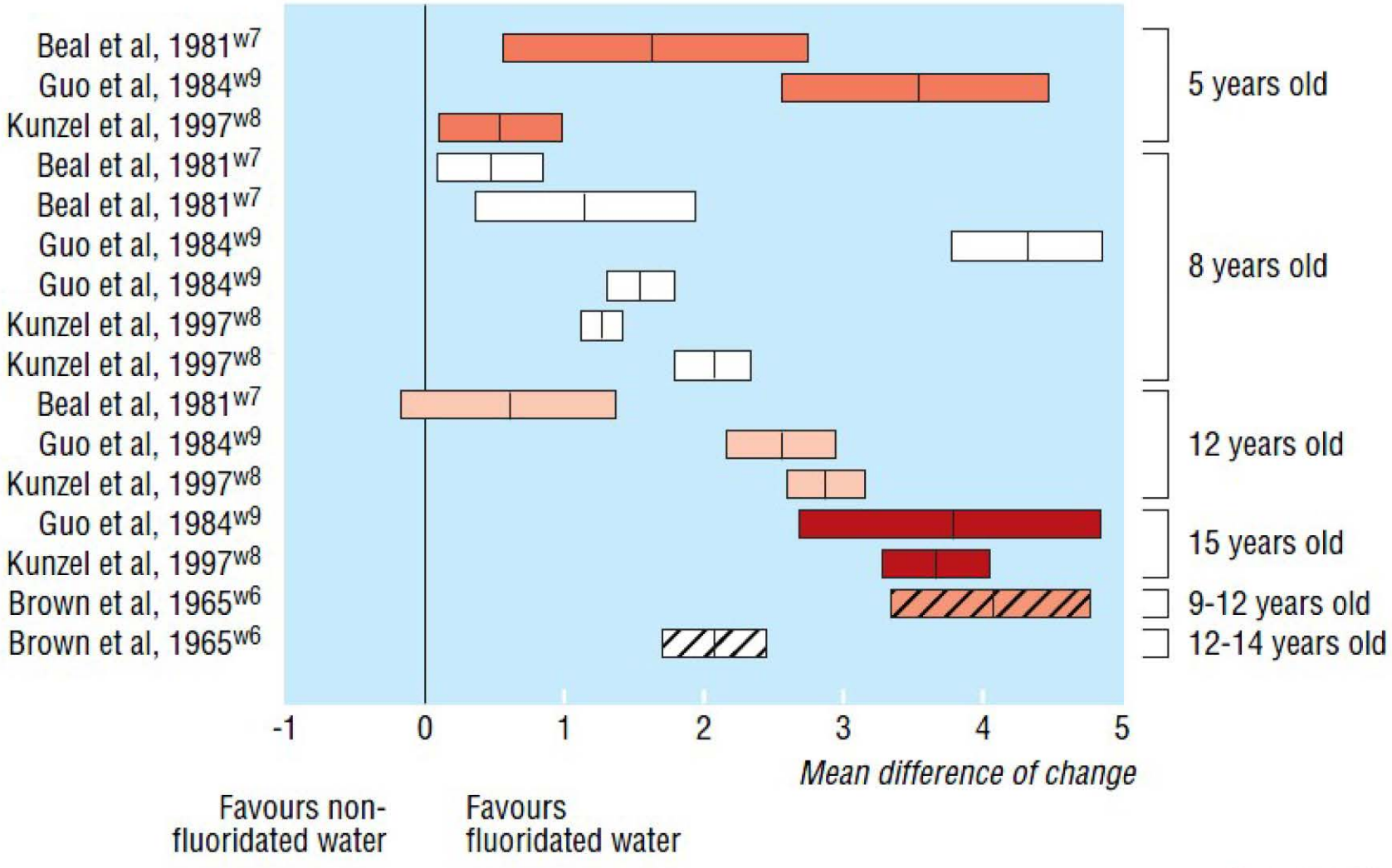
Sarnia-Brantford-Stratford Fluoridation Study



Sarnia 0 ppm F, Brantford 1-1.2 ppm F, Stratford 1.3-1.6 ppm F

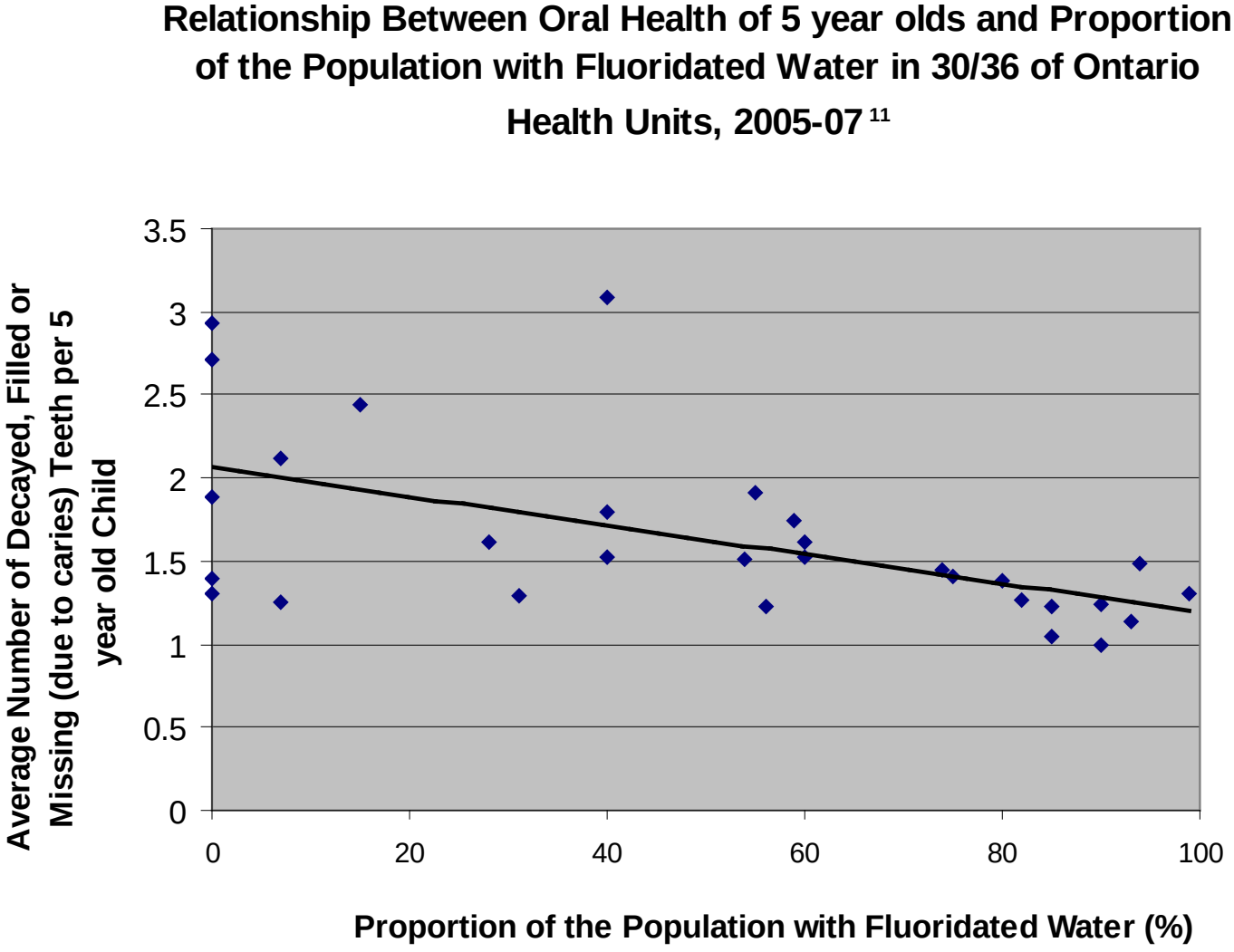
Brown HK, McLaren HR, Josie GH, Stewart BJ. Mass Control of Dental Caries By Fluoridation of a Public Water Supply: Dental Effects of Water Fluoridation, 5th Report, Dental Division, Department of National Health and Welfare, November 1955; 6th Report, August 1958

Change in decayed, missing, and filled teeth for primary/permanent teeth (mean difference and 95% confidence interval).



Source: Systematic review of water fluoridation. *BMJ* 2000;321;. McDonagh, M. et al

Relationship Of Decay Scores In 7-Year-Olds And % Population With Access To CWF



2007-08 Research Study: Dental Decay in 7-year-olds in Simcoe Muskoka

Dental Indices Survey conducted on over 1850 7-year olds
Questionnaires sent to all; 765 returned and matched.

Dental Index	Non-Fluoridated	Fluoridated	p value
Number of children	1556	311	
% Caries Free	42	58	p<0.001
deft/DMFT	3.22	1.95	p<0.001
% Fluorosis	8 (1070)	9 (220)	ns
% TSIF>1	2.3 (1070)	1.8 (220)	ns

OAPHD

2007-08 Research Study: Dental Decay in 7-year-olds in Simcoe Muskoka

Dental Indices Survey conducted on over 1850 7-year olds
Questionnaires sent to all; 765 returned and matched.

Logistic Regression Model for deft+DMFT >1

Factor	Adj. OR	95% CI
Non-F area	1.78	1.17, 2.84
First dental visit before 2	2.78	1.20, 6.47
First dental visit 2-5	4.45	1.80, 11.01
Last dental visit pain	7.25	4.40, 11.94
Between meals sugary foods	1.89	1.25, 2.84
Mother's ed comp HS or less	2.29	1.46, 3.61
Family income 40 to 60k	0.59	0.37, 0.94

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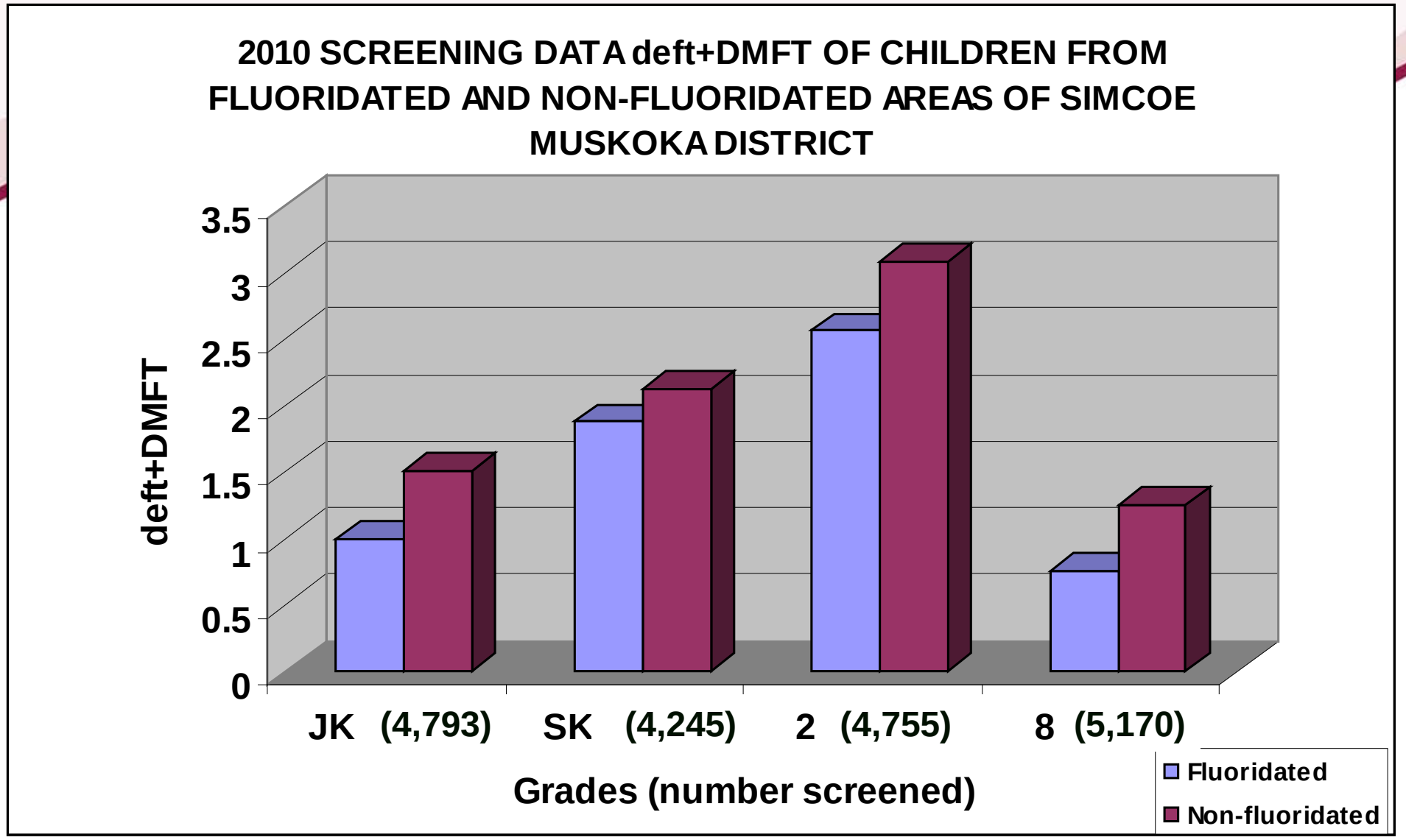
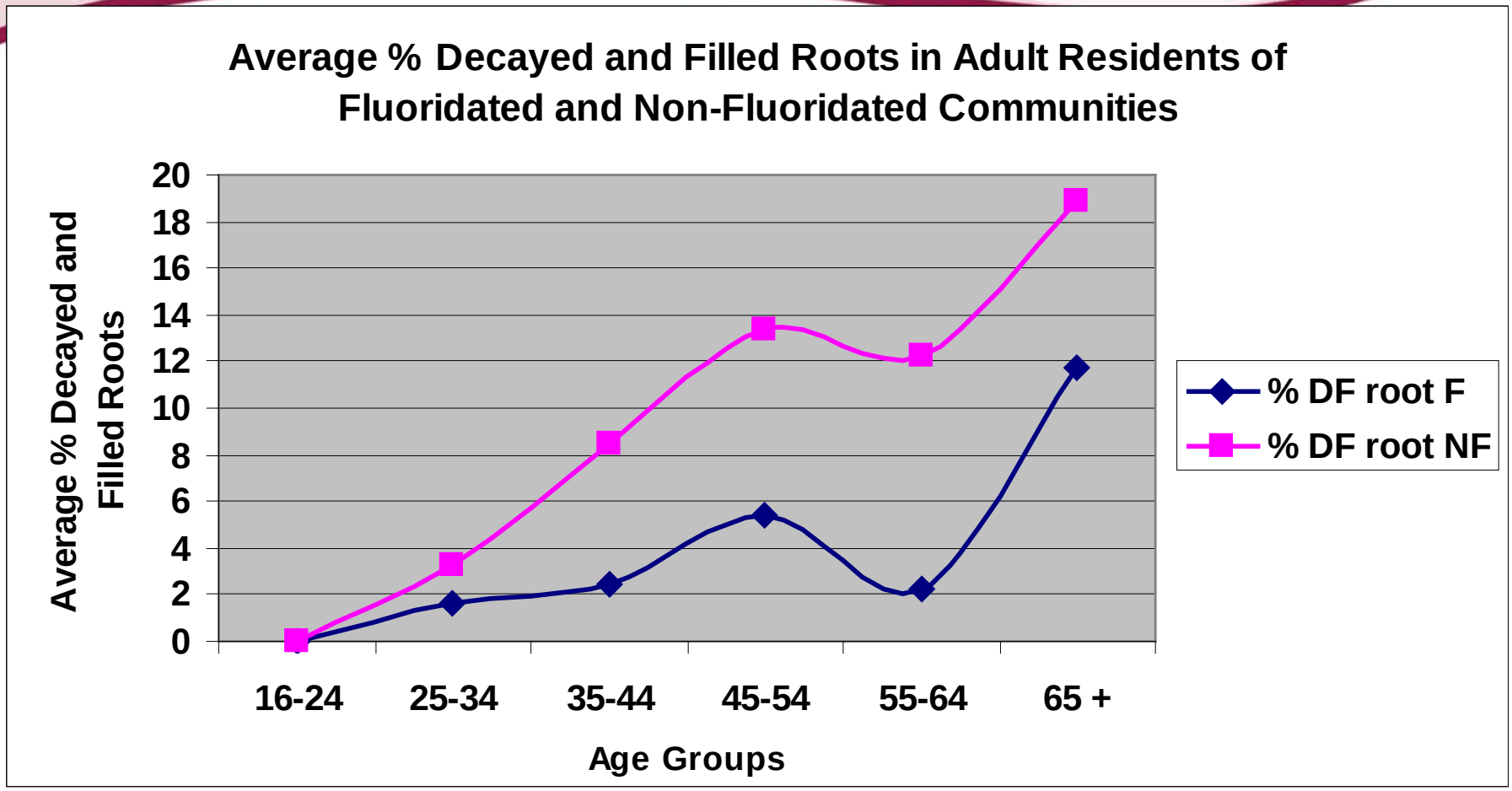

2010 SCREENING DATA deft+DMFT OF CHILDREN FROM FLUORIDATED AND NON-FLUORIDATED AREAS OF SIMCOE MUSKOKA DISTRICT
deft+DMFT
3.5
3
2.5
2
1.5
1
0.5
0
JK (4,793)
SK (4,245)
2 (4,755)
8 (5,170)
Grades (number screened)
Fluoridated
Non-fluoridated

2007-08 Research Study: Dental Fluorosis in Simcoe Muskoka

TSIF Index	Fluoridated N=220	Non-F N=1070
% Any Dental Fluorosis	9.0%	8.0%
% Dental Fluorosis of Aesthetic Concern	1.8%	2.3%

RoI Benefits of CWF - Adults



O'Mullane DM, Whelton HP, Costelloe P, Clarke D, and McDermott S, McLoughlin J. The Results of Water Fluoridation in Ireland. Journal of Public Health Dentistry vol. 56, Special Issue 1996

Similar Populations, Different Fluoridation Levels

Health Unit	Halton	Simcoe-Muskoka
Population (2006)	439,256	479,797
Pop. 0 to 19 Yr	117,405	123,105
% low-income < 18 Yr	10	10.3
% Pop. Fluoridated	90	7

Fluoridation Makes a Difference

Fewer Decayed Teeth & More Cavity-Free Teeth (Screening Data 2009-10)

	JK		SK		Gr 2	
	4,555		4,953		5,165	
Health Unit	def/DMFT	%Caries Free	def/DMFT	%Caries Free	def/DMFT	%Caries Free
Halton	0.66	82	1.11	73	1.95	58
SMDHU	1.45	69	2.09	58	3.02	44
Health Unit	def/DMFT	%Caries Free	def/DMFT	%Caries Free	def/DMFT	%Caries Free
	4,803		4,264		4,766	
	JK		SK		Gr 2	

Fluoridation Saves Money

Data: Municipal Spending for Publicly Funded Programs, 2010

Health Unit	CINOT 0 to 17 Years			OW 0 to 17 Years		
	Number Children	Amount $	Ave Cost	Number Children	Amount $	Ave Cost
Halton	971	381,555	392.95	611	148,380	242.85
Simcoe Muskoka	2066	1,040,050	503.19	1866	553,902	293.69

Fluoridation Saves Money

Data: Municipal Spending for Publicly Funded Programs, 2009

Health Unit	OW Adult Dental Basic Services	OW Adult Dentures Spending
Halton	$225,107	$160,360
Simcoe Muskoka	$357,501	$654,603

Why Orillia Should Initiate Community Water Fluoridation

- **Fluoridated communities have 20%-40% fewer caries (dental decay)**
- **Fluoridation is cost-effective: every dollar spent on water fluoridation avoids $38 in dental care, while increase in drinking water costs to consumers is less than 1%**
- **CWF benefits all consumers across socio-economic status**
- **CWF benefits all age groups, from children to senior citizens**

CDC (2005) Water Fluoridation Training for Water Treatment Facility Operators

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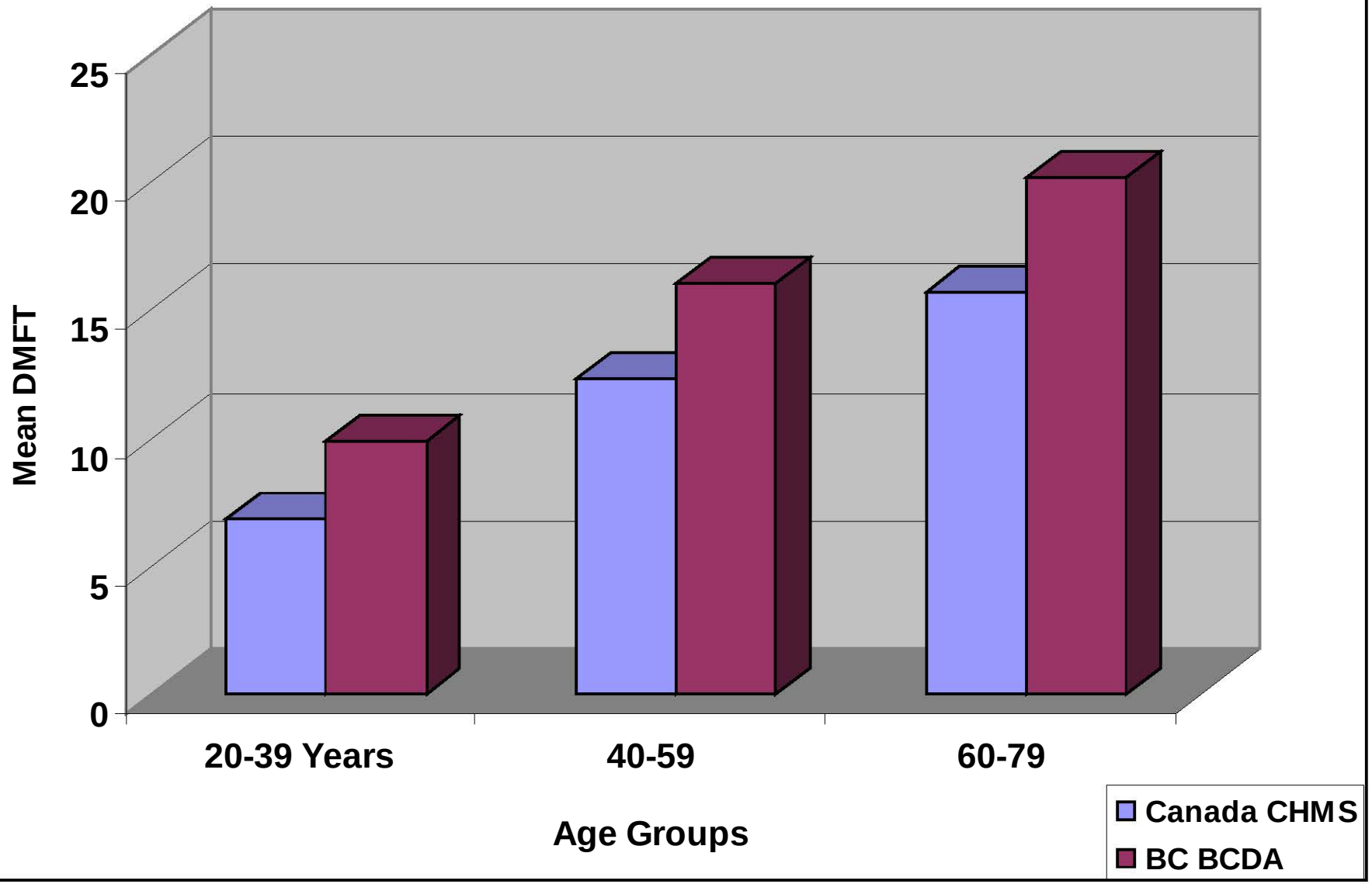
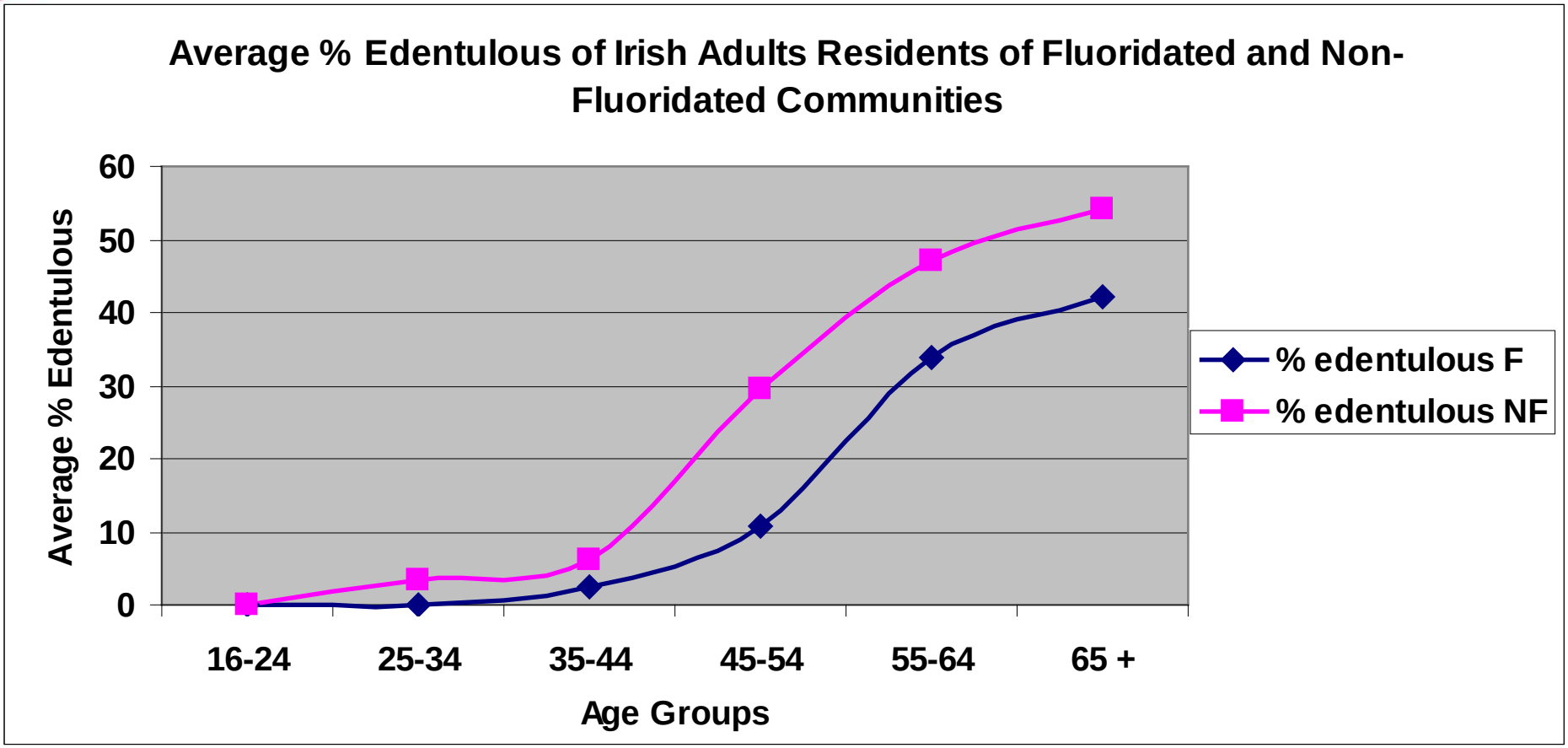
The End

Questions?

Comparison of the CHMS with the Adult Dental Health Survey, BCDA.
May 28, 2010



RoI Benefits of CWF - Adults



O'Mullane DM, Whelton HP, Costelloe P, Clarke D, and McDermott S, McLoughlin J. The Results of Water Fluoridation in Ireland. Journal of Public Health Dentistry vol. 56, Special Issue 1996

Simcoe Muskoka District Health Unit School Screening 2009-10

Grade	# Screened	def/DMFT		% Caries Free	
JK (F)	546	1.00	p<0.000	77.1	p<0.000
JK (NF)	4,247	1.51		67.6	
SK (F)	456	1.88	p=0.021	64.0	p=0.006
SK (NF)	3,789	2.12		57.4	
G 2 (F)	509	2.56	p<0.000	53.2	p<0.000
G 2 (NF)	4,246	3.08		42.8	
G 8 (F)	529	0.76	p<0.000	75.8	p<0.000
G 8 (NF)	4,641	1.25		61.8	

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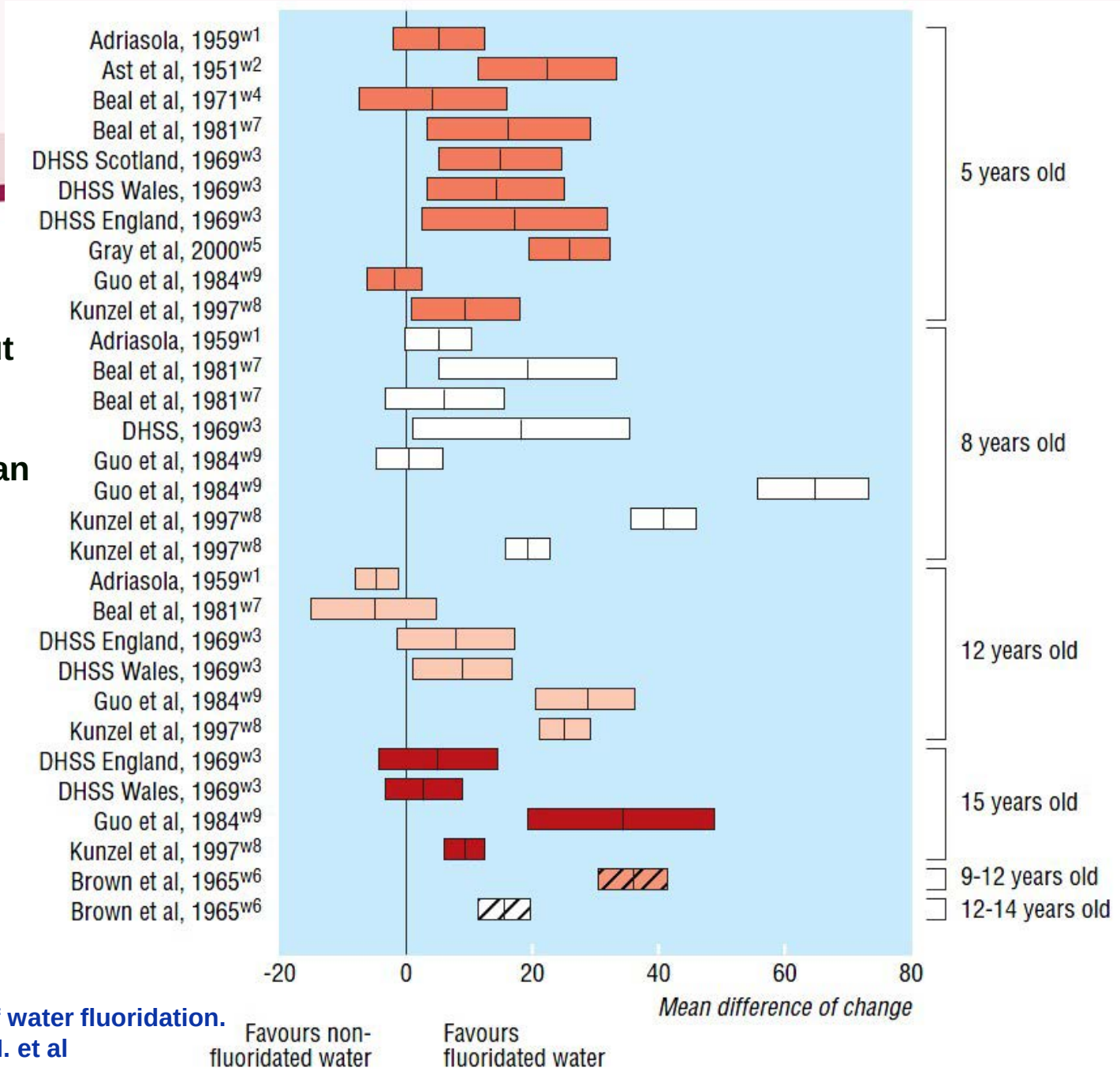
Simcoe Muskoka District Health Unit School Screening 2010-11

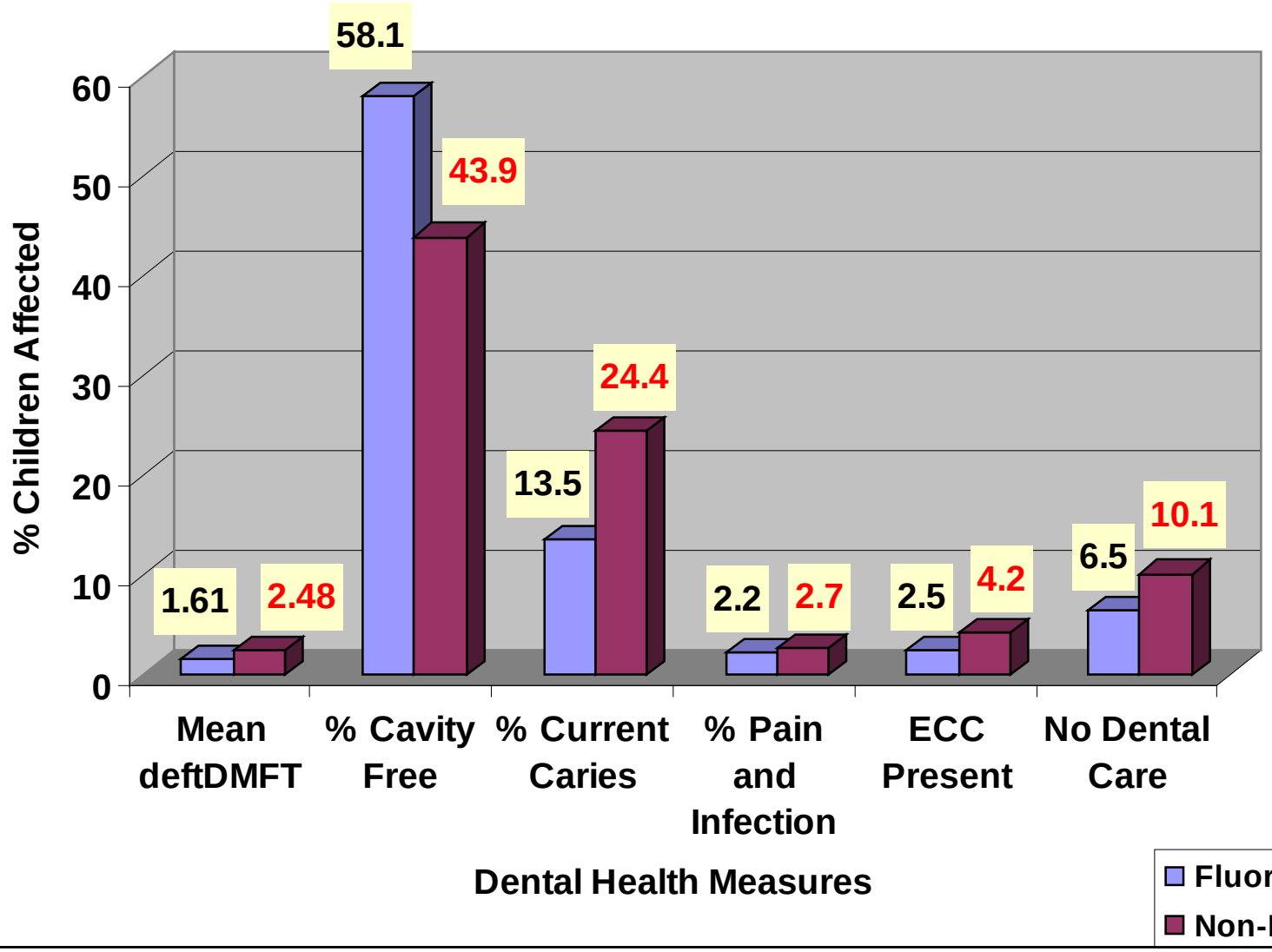
Grade	# Screened	def/DMFT		% Caries Free	
JK (F)	502	.74	p<0.000	81.0	p<0.000
JK (NF)	4,127	1.24		72.0	
SK (F)	502	1.49	p=0.003	67.0	p=0.012
SK (NF)	4,175	1.93		61.0	
G 2 (F)	530	2.21	p<0.000	57.0	p<0.000
G 2 (NF)	4,511	2.79		47.0	

Change in proportion (%) of children without caries in fluoridated compared with non-fluoridated areas (mean difference and 95% confidence interval).



Source: Systematic review of water fluoridation. BMJ 2000;321;. McDonagh, M. et al

Dental Health of Students by Access to Community Water Fluoridation (Grade One and Seven), Saskatchewan, 2008-2009



Pilly, VK. Saskatchewan Dental Health Screening Program 2008-2009 Report. December 2010. Dental health Working Group of Saskatchewan

Canada Health Measures Survey 2007-9 Oral Health Component Results

Prov	6-yr-olds		6 -11-yr-olds		12-19-yr-olds	
	defDMF>0	Mean defDMF	defDMF>0	Mean defDMF	DMF>0	Mean DMF
Que	47.5	2.42	55.0	2.35	62.8	2.82
6.4% F		27% ↓		13% ↓		19.5% ↓
Ont	37.3	1.90	50.1	2.08	56.4	2.36
75.9% F						

Goel, V. Analysis of the Globe and Mail Article on Fluoridation. May 15, 2010

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Fluorosis in Canada

***Only 3 cases of moderate/severe fluorosis and all had recently immigrated to Canada from countries that had high naturally-fluoridated water supply.**

2007-09 Survey (Canadian Health Measures Survey) of 6-12 year olds

Normal teeth	Questionable[1]	Very Mild	Mild	Moderate /severe[2]
60%	24%	12%	4%	<0.3%

[1] Ill defined and could be due to antibiotic usage, infection, severe fever, trauma etc.

[2] Highly unstable numbers

Report on the Findings of the Oral Health Component of the Canadian Health Measures Survey 2007-9. Health Canada 2010

OAPHD

Should Fluoride Be Added to Orillia's Drinking Water?

Presentation by

Alice den Otter and John Brown

The Stated Problem

In 2009, the Simcoe Muskoka District Health Unit reported that among the 10 largest communities in Simcoe Muskoka, elementary school children in Orillia have the most severely decayed teeth (SMDHU screening data, 2009-2010).

Proposed Solution by Simcoe Muskoka District Health Unit

Consider fluoridation of the City's water supply, since Orillia water contains only 0.2 mg/L of natural fluoride and since fluoride has been claimed to assist in preventing tooth decay.

Environmental Problems with Proposed Solution

- **At most, only 3% of city water is used for human consumption. (**http://www.nwwater.com/index.cfm**)**

- **The fluorides most frequently used to fluoridate water, silicofluorides, are unprocessed hazardous waste products from the phosphate fertilizer industry, contaminated with a small number of lethal toxins, particularly arsenic and lead.** (Fluoride Action Network)

- Once used as an insecticide and rodenticide, **fluoride is listed as being toxic on the EPA's Primary Standards List of Contaminants at concentrations of 4 mg per liter (mg/L) and above. The EPA Secondary Standards List of Contaminants includes fluoride as a health hazard in concentrations over 2 mg/L. (**http://water.epa.gov/drink/contaminants)

Health Problems with Proposed Solution

- **How much fluoride a person or animal actually gets depends on body weight, fluoridated water consumed, and other sources of fluoride. Thus, although levels of fluoride in water may be deemed safe at 1 mg/L, individuals may be at risk of excess concentrations accumulating in their bodies.** (On analogy, note that one can get drunk with beer, containing 5 ml/L alcohol, just as well as with vodka, containing 40 ml/L alcohol. One just needs to drink more.)

Health Problems with Proposed Solution

- **We (and our children) are getting fluoride from many other additional sources, including toothpaste, other dental products, mouthwashes, processed food, some vitamin tablets, and beverages.**

- "**Food categories with the highest mean fluoride levels were fish [2.118 ppm], beverages [1.148 ppm], and soups [0.606 ppm]. Individual samples with the highest fluoride levels were tea [4.97 ppm], canned fish [4.57 ppm], shellfish [3.36 ppm], cooked veal [1.23 ppm], and cooked wheat cereal [1.02 ppm].**" **(**US Agency for Toxic Substances and Disease Registry (2001). *Toxicological Profile for Fluorides: Draft Profile for Public Comment*. U.S. Department of Health & Human Services, Public Health Service.)

Health Problems with Proposed Solution

- **At excessive exposure levels, ingestion of fluoride causes dental fluorosis, skeletal fluorosis [with arthritis-like symptoms and potential for hip fractures], and manifestations such as gastrointestinal, neurological, and urinary problems."** (Jha SK, Mishra VK, Sharma DK, Damodaran T. (2011) *Rev Environ Contam Toxicol.* 211:121-42.)

- "Existing data indicate that subsets of the population may be unusually susceptible to the toxic effects of fluoride and its compounds. These populations include the elderly, people with deficiencies of calcium, magnesium and/or vitamin C, and people with cardiovascular and kidney problems." (U.S.Agency for Toxic Substances and Disease Registry (1993) TP-91/17, page 112 http://www.atsdr.cdc.gov/toxprofiles/tp11.html)

Fundamental Problems with Proposed Solution

- **Positive effects of water fluoridation on humans are negligible.**
  - **Fluoride has a minimal effect on teeth once it is swallowed.** (Featherstone JD (1999). *Community Dent Oral Epidemiol* 27 (1): 31–40.)
  - "**Fluoride is most effective when used topically, after the teeth have erupted.“ (**Cheng KK, et al. (2007). *British Medical Journal* 335(7622):699-702.)
  - **According to Ontario 2005-2007 data presented in the January 2009 “Focus on Oral Health” by the Simcoe Muskoka District Health Unit, the difference between one region with 100% water fluoridation and Simcoe County with less than 10% water fluoridation is an average of .8 decayed, filled, or missing (due to caries) teeth per 5-year old** (2.1-1.3 = .8). **(Figure 3). The report includes the caution: “this does not suggest that fluoride is the only factor . . . ”**

Fundamental Problem with Proposed Solution

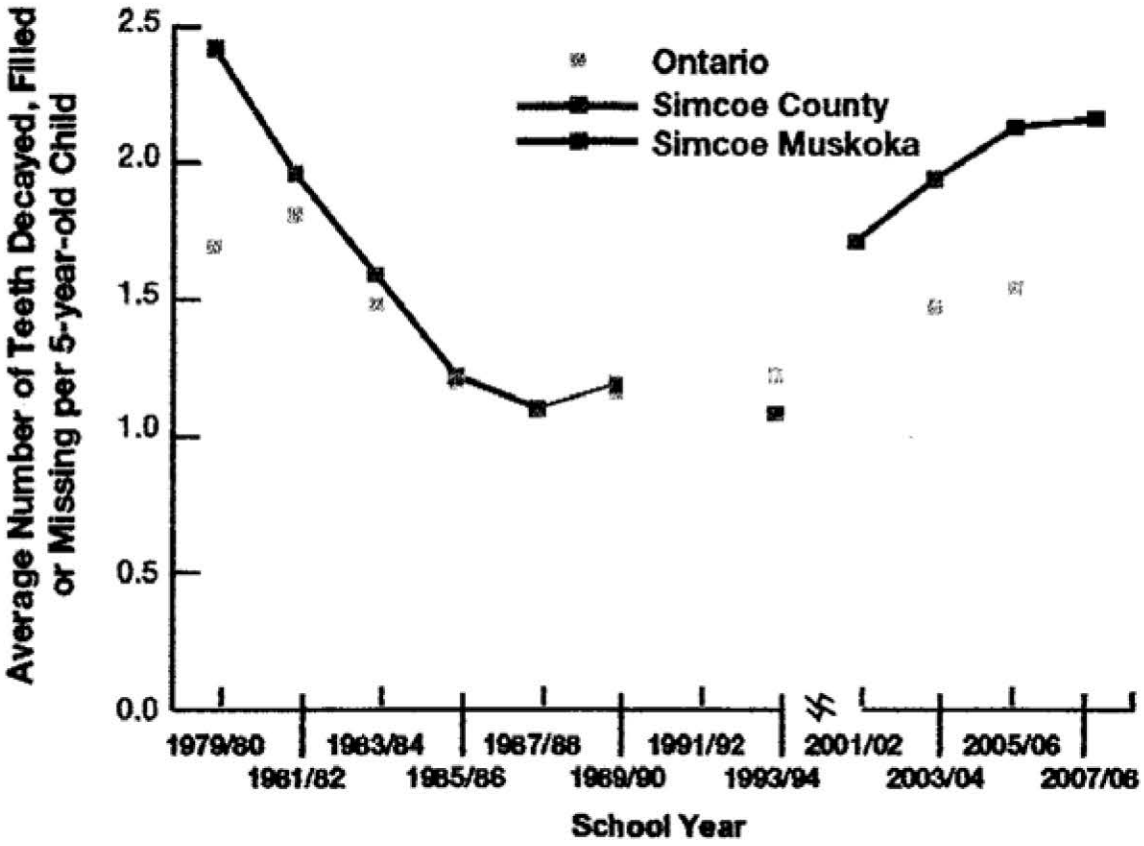
- **The proposed solution of adding fluoride to drinking water does not address the fundamental reason for increased rates of tooth decay in Orillia: low income.**

- **See Figure 1 of the January 2009 "Focus on Oral Health" produced by the Simcoe Muskoka District Health Unit: http://www.simcoemuskokahealth.org/Topics/DentalHealth/PreventingDecay/Fluoridation/References.aspx**

Figure 1

Teeth Decayed, Extracted Due to Caries, or Filled for 5-Year-Old Children

Simcoe County* and Ontario** 1979/80 - present



* From 2005-06 to present, the Simcoe data are for Simcoe Muskoka children, all previous years are for Simcoe County only

** From 2001-02 to present, the Ontario data are a weighted average for 29/36 health units

⁄⁄ Data not available for either Simcoe or Ontario

Data Source: Simcoe Muskoka District Health Unit Dental Indices Survey (DIS). 1979 – 2008
Re-collection and analysis of data from the Ontario DIS. July 1999.
Ontario Association of Public Health Dentistry Survey of Ontario Health Units. August 2008.

Fundamental Problem with Proposed Solution

- **In Simcoe County, there was a steady decrease in dental caries for 5 year olds during the period from 1979 to 1995, despite lack of water fluoridation**. An increase after 2001 is quite marked, rising steadily to 2006, with leveling off in 2007. (SMDHU Oral Health Focus Report 2009)
- **Rates of dental caries aligns very closely to poverty rates in Simcoe County.** Between 1995 and 2004, a single minimum wage income rated as a percentage of the low-income cut-off level fell from 74% to 64%. (*Campaign 2000, Working, Yet Poor in Ontario, March 2006*)

Reconsidering the Problem

- According to a 2009 article in the *Packet and Times*, "Recent local statistics show that **among those with a total household income of less than $30,000, only 53 per cent report visiting a dentist at least once per year and 36 per cent report seeing a dentist for emergencies only.** This was significantly lower than what was reported from those with total household income of more than $60,000, where 80 per cent said they visit the dentist at least once per year and only 12 per cent said they see a dentist for emergencies only." ("Oral health is important to overall health" Packet and Times Archives, 2009)

Reconsidering the Problem: Common Causes of Dental Decay

- Poor Diet – high in fermentable carbohydrates (sugars such as sucrose, glucose, and fructose), low in calcium and protein
- Poor self-care / hygiene (brushing, flossing, mouth wash)
- Minimal dental checkups & cleaning due to lack of dental insurance

Alternative Solutions to the Problem

- **Extend the Healthy Smiles Ontario program which provides no cost dental care for children 17 and under who do not have access to any dental coverage and who meet the program's eligibility requirements.** Currently a full service clinic is open in Barrie, with a mobile unit visiting other communities. (http://www.simcoemuskokahealth.org/Promos/HealthySmilesON.aspx)
  - Open a full service Healthy Smiles clinic in Orillia and make sure people know about it.
  - Assist low-income families in applying for the program

Alternative Solutions to the Problem

- **Provide free dental supplies (toothbrush, toothpaste, floss) to school children on a regular basis and teach them proper use.** (The city could subsidize any amounts beyond current practices at far less than $25,000 per year.)
- **Ensure that nutrition, eating habits, and dental care are taught in our schools and in other outreach programs.** Perhaps involve Bachelor of Education students at Lakehead University or Dental Hygiene students at Georgian College.

Alternative Solutions to the Problem

- **Ensure that those in need, who cannot otherwise afford it, do receive nutritious food, regular dental monitoring, and prompt dental care.** Some of this is already being done, but anti-poverty resources are increasingly being cut from budgets. Use the $100,000 proposed for water fluoridation and use it to ensure that Food Banks and other social agencies are able to enhance living conditions for poor children.

Thank You

Keith Morley

From: PedDentists <SOPD@LISTSERV.AAP.ORG> on behalf of Lauren Barone <LBarone@AAP.ORG>
Sent: Tuesday, January 31, 2012 2:31 PM
To: SOPD@LISTSERV.AAP.ORG
Subject: Fwd: Join us for "Community Water Fluoridation & Pediatricians - Advocates for a Proven Strategy to Protect Kids' Teeth"

STATE GOVERNMENT AFFAIRS

American Academy of Pediatrics

Community Water Fluoridation & Pediatricians - Advocates for a Proven Strategy to Protect Kids' Teeth

Join us for a Webinar on February 24

REGISTER NOW

Space is limited.
Reserve your Webinar seat now at:
https://www3.gotomeeting.com/register/289554678

Join us for a Webinar on February 24

Although most Americans have healthy teeth, nearly 1 out of 4 children between ages 6 and 11 years has untreated tooth decay. Five times more common than asthma, dental disease among young children is rampant, and yet it is easily - if not totally - preventable.

Community water fluoridation is a proven public health strategy. As fluoridation has increased, tooth decay has decreased - as much as 68% since 1966. Despite its success, however, recent public support for water-system fluoridation around the country has been waning.

Join us for a Webinar about the Academy's role in the national Campaign for Dental Health, the current debate over fluoridation, and the important role pediatricians can play in their practices and communities.

Host:

Sharon Swindell, MD, MPH, FAAP, Member, AAP Committee on State Government Affairs

Presenters:

William Maas, DDS, MPH, Consultant, Pew Children's Dental Campaign, formerly with the Centers for Disease Control and

Prevention

Kelly Adams, Senior Campaign Associate, Pew Children's Dental Campaign

Grant Allen, MD, FAAP, President, AAP-Alabama Chapter and Chapter Oral Health Advocate

Title: *Community Water Fluoridation & Pediatricians - Advocates for a Proven Strategy to Protect Kids' Teeth*
Date: Friday, February 24, 2012
Time: 12:00 PM - 1:30 PM CST

After registering you will receive a confirmation email containing information about joining the Webinar.

System Requirements
PC-based attendees
Required: Windows® 7, Vista, XP or 2003 Server

Community Water Fluoridation

Orillia City Council

February, 2012

Safety Water Fluoridation

1. Canadian & American Dental Associations
2. Canadian & American Academies
   Pediatric Dentistry

Safety Water Fluoridation

3. Canadian & American Medical Associations

4. Canadian & American Academies of Pediatrics

Safety Water Fluoridation

5. Health Canada
6. Federal Drug Agency

INTERNET

S

Childhood Tooth Decay

1. Disease caused by Bacteria

1. Most prevalent disease in children

S

The Devastation of Dental Disease in Children

S

Dental Disease Children

- Interferes with:
  - Sleep
  - Ability to eat
  - Ability to learn
- Chronic Pain
- Can be fatal

Dental Disease in Children has same morbidity as severe Tonsillitis

Access to Anesthesia services

ESSENTIAL

S

Council Choices

Eliminate Fluoride:

1. Increase pain & suffering in Children

1. Increase Health Care Costs

Council Choices

Maintain Water Fluoridation
For the sake of the Children!

S

Good evening Mayor Orsi, City Councillors, Speakers, and Fellow Orillians:

My name is Dianne Orton, I was born and raised in Orillia, my child and grandchildren live here, too. When I first heard that Orillia was in talks to fluoridate our water, I got really concerned, because I have hypothyroidism (which is under active thyroid).

I remembered reading about the effects of fluoride on the thyroid quite a while back, and when I decided to look it up, again, I discovered that sure enough, until the 1970's doctors used fluoride to treat an overactive thyroid. But for me, I have under an underactive thyroid, so adding fluoride to our water is going to dramatically and negatively impact my health and the health of others suffering from this disease, by further reducing our thyroid function. It is a serious condition with a diverse range of symptoms including: fatigue, depression, weight gain, hair loss, muscle pains, increased levels of "bad" cholesterol (LDL), and heart disease.

According to the National Research Council of the U.S., and published in Fluoride in Drinking Water: A Scientific Review of Environmental Protection Agency's Standards, 2006, I quote, "In humans, effects on thyroid function were associated with fluoride exposures . . . " So, according to the best scientific studies, fluoride is going to further impair my thyroid. In fact, anyone with thyroid problems is going to become more debilitated, and that's 30% of the population, according to the Thyroid Foundation of Canada**.** (Just go to their website. The statistic is right there on the front page.) Are you going to penalize 30% of the population of Orillia for a smaller segment of the population of Orillia, by fluoridating the water? That makes no sense.

What is my family going to do, if the water is fluoridated? Move out of Orillia? Who is moving in, once they find out about the fluoride? I'll end up taking at least a 20% reduction on the current value of my home.

By the way, I have no way to escape the fluoride from my water, as I can't afford a water filtration system that would take it out. (I've talked to water filtration specialists, and it's not that easy to get fluoride out.) So what do I do? I feel endangered.

Even if I buy bottled water, which I shouldn't have to, because I pay for Orillia water, I won't be able to do anything about showers or baths, where fluoride is going to enter my body through my skin. I won't be able to do anything about washing my fruit, vegetables, and salad greens. And fluoride will, then, be in what my organic garden of vegetables and berries. And, I guess that birds and outside pond fish will have to rely on rain, for a healthy drink.

I won't be able to eat out anymore, in Orillia, as the coffee, the tea, the water, the soft drink pumps, the cooking water, and on and on, are all going to be fluoridated. Oh, by the way,

restaurant owners should know that their businesses are going to be affected by fluoride, as Orillians will either eat out less, not at all, or go to Barrie.

I even realized that I won't be able to swim at the YMCA pool, or shower there, so I'll have to give up my YMCA membership. The huge list of negatives just goes on and on.

And just so you know, hypothyroidism is just one of many health problems proven to be negatively impacted by fluoride. What about the people with kidney disease, whose kidneys don't function at 100%. When you have that problem, fluoride accumulates in the bones and tissues at much lower doses than in the rest of the population. They are at greater risk for crippling skeletal fluorosis. (See 1. on attached sheets.)

What about the people with osteoporosis? They are at greater risk for hip fractures by ingesting fluoride. (See 2. on attached sheets.)

There are so many more health problems related to fluoride ingestion, but on the basis of just the few illnesses I have mentioned, I am asking Orillia City Council to, please, vote, "No," to fluoridating our water supply. I and so many other Orillians, don't need even more health problems than we already have.

The first few people I spoke with, regarding the fact that Orillia was in discussions to fluoridate our water, said, "Really," because they didn't even know, so the city has been doing a poor job of getting that word out there. (The city would have to put in more phones, and hire more people, to handle the calls, from upset Orillians, if the word **really** got out there.)

I, also, learned that most people don't look at their toothpaste tube. It says right on it that **sodium fluoride should not be swallowed**. Let me say that again. Right on your toothpaste tube, it says that **sodium fluoride should not be swallowed**. Why in the heck would I want to swallow the fluoride in my drinking water, then? I don't swallow my shampoo!

Even more alarming, I couldn't find one study that showed that swallowing fluoride made any kind of difference to the dental health of anyone. Ingesting fluoride does not work to prevent tooth decay! Let me say that again, swallowing fluoride does not work to prevent tooth decay. So if you are unwilling or unable to spend the time, yourself, to look into the scientific research on this, vote, "No." If you don't know, vote "No!" (See 3. on attached sheets.)

Here's an even a bigger shocker. Did you know, the type of fluoride used to fluoridate water is a toxic by-product of the phosphate fertilizer industry? It is not the type of fluoride that is in your toothpaste. It's toxic waste. Nobody tells you that. (See 4. On attached sheets.)

Undoubtedly, our Public Works Department, in Orillia will be using Hexafluorosilicic Acid to fluoridate the water. That's one of those toxic by-products of the phosphate fertilizer industry. Hexafluorosilicic acid has the same Ph as battery acid (about 1.0 to 1.2) - which eats a hole in a concrete floor very quickly! Your waste water, with this chemical in it, along with the other chemicals that come in its mixture, like arsenic and lead, will be fed into our lake, untreated, by the sewage plant. How can it be illegal to dump Hexafluorosilicic Acid, and the other toxic elements that come with it, into the ocean, but it is legal to dump it into our small, shallow lakes?

As a side note: It seems like a backward step, when the federal government is giving us 2.9 million dollars to help clean up Lake Simcoe, that we would dump toxins into that water, especially when only 1% of the water we use ever touches a tooth.

It should be made clear that even though public works might be able to control concentration in the water, there is no way to control the dosage that each individual gets, as each individual's water usage is not controlled. Also, I have grave concerns for the health and safety of those working with this toxic waste substance, as well as for how much lead, from pipes, is going to be leached into our water, when this corrosive substance starts pulling it from our pipes.

Budgeting concerns are just too numerous to entertain in this brief presentation, most likely the budget is very preliminary and very sketchy. It is going to cost a lot more than we are being told.

At this point, I cannot understand how anyone with a conscience could put toxic waste into our drinking water. That's got to be illegal, aside from the fact that it completely lacks common sense. Why? Because one segment of the population has one problem? Are you going to penalize everyone, to ensure that one segment of the population gets this toxin? That boggles my mind.

Why don't you treat the causes of the cavities in the young people of Orillia – poor nutrition, low income, and lack of dental hygiene education? Start treating the causes of the problem, and stop trying to treat one symptom of the problem.

Oh, by the way, the provincial Healthy Smiles program, as of December 19, 2011, has been implemented in Orillia, so the young Orillians most affected by dental decay are going to have their dental needs looked after, for free. Even if swallowing fluoride in the water could do any good, which it can't, there is no longer any need to fluoridate the water.

Because of this dental program for financially disadvantaged Orillians, up to 17 years of age, the Public Health people will never be able to make the claim that the reason the cavities in our

young people were reduced is because of fluoridation. They would have to factor out all of the kids who got assistance from this program. (Please, don't forget that I said this.) This is, yet, another reason not to fluoridate the water, aside from the most important fact – swallowing fluoride does not work to prevent tooth decay!

Once again, city council, I am asking you to vote, "NO," to fluoridating our water. For your benefit, I have attached scientific research, to back up what I said here, tonight. It is your responsibility to look at all of the information presented, including the scientific research, all of it, before you vote. Please, don't dismiss any of it, or gloss over it. Don't injure Orillians! Don't harm our health! Vote, "No," to fluoridating our water. And, please, If You Don't Know, Vote, "No."

Thank you, everyone.

1. **Kidney Disease – Backup For Statements Made In Presentation By Dianne Orton**

"Individuals with kidney disease have decreased ability to excrete fluoride in urine and are at risk of developing fluorosis even at normal recommended limit of 0.7 to 1.2 mg/l."
SOURCE: Bansal R, Tiwari SC. (2006). Back pain in chronic renal failure. Nephrology Dialysis Transplantation 21:2331-2332.
"In patients with reduced renal function, the potential for fluoride accumulation in the skeleton is increased. It has been known for many years that people with renal insufficiency have elevated plasma fluoride concentrations compared with normal healthy persons and are at a higher risk of developing skeletal fluorosis."
SOURCE: National Research Council. (2006). Fluoride in Drinking Water: A Scientific Review of EPA's Standards. National Academies Press, Washington D.C. p140 .
"Because the kidney is the main pathway of fluoride excretion, patients with chronic renal failure are especially vulnerable toosseous accumulation of ingested fluoride and to potentially deleterious effects."
SOURCE: Fisher JR, et al. (1981). Skeletal fluorosis from eating soil. Arizona Medicine 38: 833-5.
"In the human body, the kidneys are probably the most crucial organ during the course of low-dose long-term exposure to fluoride. Healthy kidneys excrete 50 to 60% of the ingested dose (Marier and Rose 1971). Kidney malfunction can impede this excretion, thereby causing an increased deposition of fluoride into bone. Marier (1977) has reviewed data showing that, in persons with advanced bilateral pyelonephritis, the skeletal fluoride content can be 4-fold that of similarly-exposed persons with normal kidneys. Similarly, Mernagh et al. (1977) have reported a 4-fold higher skeletal fluoride content in persons with the renal failure of osteodystrophy. It has also been shown (Seidenberg et al. 1976; Hanhijarvi 1975) that plasma F- levels can be 3 1/2 to 5 times higher than normal in persons with renal insufficiency. It is thus apparent that persons afflicted with some types of kidney malfunction constitute another group that is more "at risk" than is the general population."

SOURCE: Marier J, Rose D. (1977). Environmental Fluoride. National Research Council of Canada. Associate Committe on Scientific Criteria for Environmental Quality. NRCC No. 16081. "The question of the effect of water containing 1 p.p.m. upon patients with severe impairment of kidney function requires special consideration in view of the fact that radiologic evidence of chronic fluorosis has been found in two persons with severe kidney disease who died at the early ages of 22 and 23 years, respectively..."
SOURCE: Heyroth F. (1952). Hearings Before the House Select Committee to Investigate the Use of Chemicals in Foods and Cosmetics, House of Representatives, 82nd Congress, Part 3, Washington D.C., Government Printing Office, p. 28.

2. Hip Fractures – Backup For Statements Made In Presentation By Dianne Orton

Journal of Bone and Mineral Research

Increased incidence of hip fracture in osteoporotic women treated with sodium fluoride

1. L. Rune Hedlund,
2. J. C. Gallagher M.D.*

Volume 4, **Issue 2**, **pages 223–225**, **April 1989**

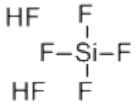
There has been controversy as to whether fluoride therapy increases the risk of fracture in the appendicular skeleton. In the present study we compared the incidence of hip fracture in four groups of osteoporotic women: 22 treated with placebo, 17 with fluoride and calcium, 18 treated with fluoride and calcitriol, and 21 with calcitriol alone. Four hip fractures occurred in 3 patients on fluoride and calcitriol, and two hip fractures occurred in 2 patients on fluoride and calcium. No hip fractures occurred in patients receiving either calcitriol alone or placebo. The difference in fracture rates for fluoride versus nonfluoride treatment is significant (p = 0.006). Moreover, the six hip fractures occurring in patients receiving fluoride during 72.3 patient years of treatment is 10 times higher than would be expected in normal women of the same age. The probability of observing six fractures in 2 years is extremely small (0.0003). In four of the hip fracture cases, the history suggested a spontaneous fracture. These findings suggest that fluoride treatment can increase the risk of hip fracture in osteoporotic women.

3. See File Labelled Research Ingested Fluoride Does Not Prevent Tooth Decay – Backup For Statements Made In Presentation By Dianne Orton

4. Hexafluorosilicic Acid – Backup For Statements Made In Presentation By Dianne Orton

See also attached file – Material Safety Data Sheet Fluorosilicic Acid
See also attached file – Review of Toxicological Literature Re Hexafluorosilicic Acid
See also attached file – Fluoridation: A Horror Story

Hexafluorosilicic acid



CAS No. 16961-83-4

Chemical **Hexafluorosilicic acid**

Hexafluorosilicic acid	**Name:**	
	Synonyms:	ACTH;ACTH 1-39;Sand acid ;CORTICOTROPHIN;CORTICOTROPIN A;FLUOSILICIC ACID;FLUOROSILIC ACID;Fluorsilicic acid;SILICOFLUORIC ACID;FLUOROSILICIC ACID
	CBNumber:	CB3726895
	Molecular Formula:	F6H2Si
	Formula Weight:	144.09
	MOL File:	16961-83-4.mol

Hexafluorosilicic acid Property

bp :	108-109°C
density :	1.22 g/mL at 25 °C
refractive index :	1.3500
Fp :	108-109°C
storage temp. :	−20°C
solubility :	H_2O: 1 mg/mL, clear, colorless
Merck :	14,4182
Stability::	Stable in aqueous solution.
CAS DataBase eference:	16961-83-4(CAS DataBase Reference)
EPA Substance Registry	Silicate(2-), hexafluoro-, dihydrogen(16961-83-4)

System:

Safety

Hazard Codes :	C
Risk Statements :	34
Safety Statements :	26-36/37/39-45-27
RIDADR :	UN 1778 8/PG 2
WGK Germany :	3
RTECS :	VV8225000
F :	8-10
Hazard Note :	Corrosive
TSCA :	Yes
HazardClass :	8
PackingGroup :	II
Hazardous Substances Data:	16961-83-4(Hazardous Substances Data)

Hexafluorosilicic acid Chemical Properties,Usage,Production

Chemical Properties

colourless liquid; often supplied as a colourless solution in water

General Description

A colorless fuming liquid with a penetrating pungent odor. Corrosive to metals and tissue. Both the fumes and very short contact with the liquid car cause severe and painful burns. Used in water fluoridation, in hardening cement and ceramics, as a wood preservative.

Air & Water Reactions

Fumes in air. Soluble in water with release of heat and corrosive fumes.

Reactivity Profile

Hexafluorosilicic acid can react with strong acids (such as sulfuric acid) to release fumes of toxic hydrogen fluoride. Attacks glass and materials containing silica. Reacts exothermically with chemical bases (examples: amines, amides, inorganic hydroxides). Reacts with active metals, including iron and aluminum to dissolve the metal and liberate hydrogen and/or toxic gases. Can initiate polymerization in certain alkenes. Reacts with cyanic salts and compounds to release gaseous hydrogen cyanide. Flammable and/or toxic gases are also often generated by reactions with dithiocarbamates, isocyanates, mercaptans, nitrides, nitriles, sulfides, and weak or strong reducing agents. Additional gas-generating reactions may occur with sulfites, nitrites, thiosulfates (to give H2S and SO3), dithionites (SO2), and carbonates. Can catalyze (increase the rate of) chemical reactions. Decomposes when heated to the boiling point to produce very toxic and corrosive hydrogen fluoride gas.

Health Hazard

Inhalation of vapor produces severe corrosive effect on mucous membrane. Ingestion causes severe burns of mouth and stomach. Contact with liqu or vapor causes severe burns of eyes and skin.

Fire Hazard

Special Hazards of Combustion Products: Irritating fumes of hydrogen fluoride may form in fire.

Hexafluorosilicic acid Preparation Products And Raw materials

Raw materials

Calcium fluoride Hydrofluoric acid Silicon dioxide Silicon dioxide Sulfuric acid Celite

Preparation Products

Ammonium hexafluorosilicate Sodium fluoroaluminate Magnesium fluorosilicate Potassium tetrafluoroborate Potassium fluoride Sodium tetrafluoroborate MAGNESIUM HEXAFLUOROACETYLACETONATE DIHYDRATE Chromic acid Potassium fluorosilicate Magnesium fluosilicate Magnesi hexafluorosilicate hexahydrate Sodium tripolyphosphate Aluminum fluoride Sodium fluorosilicate CUPRIC FLUOROSILICATE Trisodium hexafluoroaluminate Ammonium fluoborate Sodium fluoride ZINC SILICOFLUORIDE Lead

Hexafluorosilicic acid Suppliers Global(86)Suppliers

BELGIUM 1

Fluoridation: A Horror Story

By Wade Frazier

Introduction

Earlier drafts of this essay had a several page chemistry narrative at its beginning, which presented some germane aspects of chemistry, to make this essay more understandable. Early readers felt it was too much technical information for those in the lay audience, particularly as they begin their reading experience.

The original chemistry prelude was designed to help the reader understand the nature of fluoride, why it is used in industry how it is, why it is a waste product of certain industrial processes, and lays the groundwork for understanding why it was so important in the nuclear industry. To make it easier on readers, that prelude is now an addendum to this essay. Reading the prelude is not imperative to understanding this essay, but might make some things clearer.

In short, fluorine is the most reactive element known to science ("reactive" means its affinity to bonding with other elements).[1] In nature, fluorine is found bonded to other elements, never floating around by itself, and is rarely found in its ionic state. The industrial processes of the nineteenth century created the most toxic pollutants that

humanity had seen to that time. Taking ore from the earth and removing the metal, especially in aluminum refining, created hazardous waste.

In its ionic state, fluorine is highly toxic. Fluorine bonded to metallic ore in the earth was liberated during the refining process and is difficult-to-impossible to safely dispose. The aluminum refining industry was the biggest and most influential fluoride polluter around 1930, and in America only one company was in the aluminum business: ALCOA.

Fluorine is also useful in producing artificial chemicals such as Teflon and Freon, because of its unique properties. Those unique properties also made fluorine indispensable in refining uranium to extract its most radioactive isotope, which made the nuclear age possible.

Compulsory Fluoridation: An Industrial Tale

The increasing industrialization of the late nineteenth and twentieth centuries saw an explosion in aluminum use. Aluminum is a ubiquitous substance in industrialized societies. It is everywhere, from electrical wiring to food and beverage cans to cookware to automobiles to airplanes. As the Industrial Revolution was hitting its stride a century ago, the aluminum refiners had a major problem with the fluorides attending aluminum production: they are deadly poisons. Fluorine once safely bound with aluminum, copper and iron in the earth's crust was reintroduced into the environment in its ionic state. The fluorides were not only being buried in the ground and put into the water, they were also being released into the air by industrial processes. Fluoride pollution was a major industrial problem.

John Yiamouyiannis, in his influential *Fluoride and the Aging Factor*, described how the fluorine ion disrupts enzyme activity and attacks DNA and protein. In his theories, backed up by research, the fluorine ion particularly disrupts hydrogen bonds. When chemicals are dumped together, the elements that have a higher bonding affinity will "steal" the bonds from other elements. Because it holds its electrons more tightly than any other element, fluorine forms the smallest negatively charged ions of all the elements, and that small size allows them to go where larger ions cannot. Those fluorine ions can get into the nooks and crannies of larger molecules, such as enzymes and DNA, and wreak biological havoc. Those fluorine ions disrupt weaker bonds in those larger molecules, damaging or destroying the original substance, disabling its biochemical usefulness. The fluorine ion acts similarly to "free radicals" in the body, with its net electrical charge interfering with biochemical reactions. That is how the fluorine ion harms or kills people.

Another common industrial element, chlorine, behaves similarly, and the chlorine issue is another one where chlorine is undoubtedly carcinogenic, among other health hazards, but industrial propaganda and criminal activity keeps the heat off chlorine.[2]

Chlorine is the other element compulsorily added to the water supply, to kill microorganisms.

There is no arguing that fluorides are deadly poisons. No scientist will argue the point, as it is universally accepted. Among the hazards of fluoride are dental fluorosis, skeletal fluorosis, sterility, birth defects, cancer and brain damage.

Dental fluorosis progresses with an increase in the fluorine ion concentration that teeth are subject to. Dental fluorosis progresses as follows. First, the teeth develop a mottled look. Flecks can be seen on the enamel. Tooth mottling can begin at less than one part per million (PPM), which is the concentration added to the water supply in communities that fluoridate their water. As the concentration rises to two PPM, the teeth discolor, gradually turning brown. Accompanying this process, the teeth become hard and brittle. The teeth then begin chipping and disintegrating. In Frank McClure's *Water Fluoridation*, *The Search and the Victory*, there is a color photo section showing the disease's progress. In advanced cases, the teeth are reduced to blackened stumps (images of this process are easily available on the Internet). With skeletal fluorosis, the skeleton disintegrates.

In 1916, G.V. Black and F.S. McKay presented the first study of tooth mottling. Tooth mottling was common in children in Colorado, Texas and other western states, and an effort was launched to determine its cause. In Colorado the condition was known as "Colorado Brown Stain," and in Texas it was "Texas Teeth." In 1931, three independent studies concluded that tooth mottling was caused by fluorine ions in the water supply, and it has been generally accepted ever since.[3] Usually the fluorine ions were naturally occurring.

Because humankind is the only animal to drill wells, we are often exposed to water that has a high natural fluorine ion content, generally in areas where there is little rainfall and the groundwater's dissolved mineral content is naturally high, and also in areas of volcanism. There are places where well water has a naturally high fluoride content, where the people die at an early age from fluoride poisoning and have other fluoride-related ailments. In *Fluoride and the Aging Factor,* John Yiamouyiannis devotes chapters of his book to presenting cases where that has happened. McClure's *Water Fluoridation, The Search and the Victory*and Waldbott's *Fluoridation, The Great Dilemma* extensively document the hazards of environmental fluorides.

By the turn of the 20th century, industrially created airborne and waterborne fluorides were becoming a major health hazard. In 1901, one study found that fluorides "are much more toxic than the other compounds that are of significance in the industrial smoke problem."[4] As early as 1850, people and livestock were being poisoned by fluoride emissions from the iron and copper industries.[5] In 1930, the world's first major air pollution disaster happened in Belgium's Meuse Valley, where thousands of people became violently ill, and sixty people died. The world's foremost authority on the issue, Kaj Roholm, concluded that airborne fluorides were responsible.[6] The fertilizer industry was mainly responsible in that instance. As late as 1970, the U.S. Department

of Agriculture stated that airborne fluorides “caused more worldwide damage to domestic animals than any other air pollutant.”[7]

In America, with its industrialized economy, there was only one aluminum company in the 1930s, in the standard monopoly situation. The Aluminum Company of America, ALCOA, was probably the world's biggest fluoride polluter at the time.

On the heels of the discovery that fluoride caused tooth mottling, Public Health Service (PHS) scientist Trendley Dean, the first director of the National Institute of Dental Research, was sent west. As Secretary of the Treasury, Andrew Mellon had authority over the PHS, and Mellon founded and was the controlling shareholder of ALCOA. Dean's mission was to research communities where naturally occurring fluoride was high in the water supply, to see how much fluoride children’s teeth could absorb before disintegrating. There was an obvious conflict of interest in Dean’s research. Dean announced his results and made the statement that fluoride in the water supply decreased tooth decay in children. Below is some of the pertinent data Dean created.[8]

City	Fluoride PPM	% of cavity-free children	% with fluorosis
Pueblo, CO	0.6	37	2.4
Junction City, CO	0.7	26	1.7
East Moline, IL	1.5	11	24.5
Monmouth, IL	1.7	55	42.1
Galesburg, IL	1.8	56	35.1
Colorado Springs	2.5	41	67.6

The only unmistakable trend is the one showing dental fluorosis increasing with fluoride concentration, which was expressly what Dean went west to determine. Black and McKay noted that mottled teeth did not seem to have a higher incidence of tooth decay, and Dean extended those findings, although that was not his job. A man was specifically assigned to investigate the damage a particular chemical did to teeth, but somehow concluded that the chemical was actually good for teeth. To paraphrase Dean’s findings: “As children’s teeth disintegrate, they may have fewer cavities.” Dean is known today as the “father of fluoridation.” It has now been admitted by virtually everybody involved in the fluoridation issue, even by Dean himself (given under oath on a witness stand), that his early data gave zero evidence that increasing fluoride concentration in the water supply reduced tooth decay.

Dean later became one of fluoridation’s propagandists, but was initially cautious with his suggestion. Dean’s questionable suggestion regarding the potential dental benefits of

fluoride was all that ALCOA-related scientist Gerald Cox (he worked for the Mellon Institute in Pittsburgh) needed to begin proposing that the nation's water supplies be fluoridated. In 1937 Cox announced, "It is possible that fluorine is specifically required for the formation of teeth."[9] Cox was the first to suggest the compulsory fluoridation of entire communities. Ironically, the PHS spent the ten years after 1931 trying to *eliminate* fluorine ions from the water supply, given the tooth mottling findings. Cox partly based his fluoridation suggestion on the work of Gerald Armstrong, who in 1938 published findings that decayed teeth seemed to have lower fluorine content than healthy teeth. In 1963, Armstrong published a reinvestigation of his 1938 findings, and concluded that his earlier findings were wrong, and that there was no detectable difference in the fluoride content of healthy and decayed teeth.[10] The discovering scientists themselves admitted that the two major scientific findings of the 1930s that showed that fluoride might be good for the teeth, and were the basis of later campaigns to compulsorily fluoridate water supplies, were worthless.

Naturally occurring fluoride in the water supply is usually composed of fluorine and *calcium* atoms. What component of dissolved calcium fluoride might have a positive effect on bones and teeth? The calcium aspect was ignored, while the fluorine component was obsessively pursued. The fluoride compounds artificially added to the water supply are sodium fluoride and fluosilicic acid, which are *industrial waste byproducts*. By the 1950s, the National Institute of Dental Research (NIDR) became a corrupt organization that produced "research" that fluoride polluters used to protect themselves from liability lawsuits.[11]

If the data supporting fluoridation is analyzed, it quickly becomes evident that all the pro-fluoridation people have in their favor are highly uncertain statistics. The theories are conflicting, as is the data.[12] While fluorine is found in bones and teeth, so are other elements that nobody says are essential for health (and even toxic), and more than 80% of fluorine given to humans and animals in experiments is immediately excreted.[13] The same mechanisms that supposedly protect teeth also cause tooth mottling. It is quite the double-edged sword. Even giving the pro-fluoridation forces the benefit of the doubt regarding their statistics, their data on the benefit of fluoride amounts to one tooth per mouth, not an exciting benefit.[14] It is an alarmingly small benefit when the undeniable harm caused by fluoride is considered. Benjamin Disraeli said, "There are three kinds of lies: lies, damned lies and statistics." Fluoridation data is a classic case of statistical gamesmanship. Even if the motivation of most pro-fluoridation researchers were not suspect, their empirical and statistical methods are. Many astute criticisms have been leveled at the methods of fluoridation researchers regarding uncontrolled variables, omission of pertinent data, mathematical errors, and outright bogus science.[15]

Among the giants of the early days of fluoridation research were Trendley Dean, Frank McClure, Harold Hodge, Edward Largent, Wallace Armstrong, David Ast, and Gerald Cox. Dean worked for ALCOA owner Mellon at the PHS. Gerald Cox worked for the Mellon Institute. Largent was the most visible member of the research teams at Kettering Laboratories at the University of Cincinnati, funded by ALCOA and several

other fluoride-polluting companies. Largent was a consultant for Reynolds Aluminum. McClure was one of fluoridation's greatest cheerleaders, working for the industry-influenced National Institute of Dental Research. Armstrong was a comrade-in-arms with Dean and McClure, promoting fluoridation. Hodge had a sinister relationship to the fluoridation issue, recently discovered through declassified U.S. documents, also tainting Ast.

Dean was not the first person to suggest that fluoride might be good for teeth. It was suggested as early as 1892, as it was detected in bones and teeth, although experiments in the 1920s disproved the notion.[16] It had not yet been established that fluoride caused "tooth mottling," but already scientists were trying to see if fluoride might be good for teeth. There were health disasters happening throughout the industrialized world due to fluoride, but a handful of ALCOA-influenced/funded scientists tried seeing how fluoride might be good for health. They and their corporate sponsors eventually prevailed, as money talks loudly in America.

Although the industrial scientists' well-paid efforts were important, it was up to a lawyer to literally ram fluoridation down the American public's throat. In 1947, ALCOA's lead counsel, Oscar Ewing, was named to head the Federal Security Agency (FSA), which later became the U.S. Health, Education and Welfare Department (today it is called the Department of Health and Human Services, or HHS). Ewing went on the ALCOA payroll in 1944 at the astounding salary of $750,000 per year. The FSA oversaw the PHS, and the same year Ewing began at the FSA, he initiated a national fluoridation project through the PHS, helping to build a bandwagon for fluoridation in the absence of any credible scientific data. At that time, there were two cities undergoing water-supply fluoridation tests: Grand Rapids, Michigan and Newburgh, New York. The tests were to run for ten to fifteen years to collect data. Ewing began campaigning for a national fluoridation program when those tests were only two years old, and no significant data was available or even possible. None other than Edward Bernays, the "father of public relations" and one of the greatest propagandists of all time, designed Ewing's public relations campaign for fluoridation. Bernays also designed the campaign by the American Tobacco Company to addict American women to tobacco, and Joseph Goebbels adopted Bernays' work in his Nazi propaganda campaigns against the Jews.[17]

By 1950, 89 cities were fluoridated, despite no credible evidence ever submitted demonstrating that it reduced tooth decay, or doing anything other than causing disease, misery and death. By 1950, ALCOA was in a new line of business, selling sodium fluoride to cities to put into their water supply. ALCOA was advertising the blessed purity of its sodium fluoride. Reality had been inverted, with a deadly industrial waste being forced down the American public's throat as "medicine." That reality remains inverted to this day. Eventually, the fluoridation results for Newburgh and Grand Rapids were partially published and have largely been ignored ever since. Although there was no measurable decrease in tooth decay, Newburgh boys had twice the incidence of skeletal deformities and a higher tooth-mottling rate as compared to the unfluoridated control group in nearby Kingston. Seeing how Newburgh fared, Kingston

has successfully resisted having its water supply fluoridated for nearly sixty years. Other Newburgh data was noteworthy, although largely suppressed: Newburgh developed one of the highest heart disease rates in the United States, and girls came to puberty earlier than the control group. The heart disease rate in Grand Rapids doubled after the first five years of the fluoridation experiment.[18]

Such an anti-scientific rush gathers its own momentum, similar to a stampeding herd. The PHS and other bureaucracies would never back down from their position, no matter what. Fluoridation's proponents have even admitted that.[19] It has taken several centuries for the Catholic Church to admit that the Inquisition was probably not such a great institution. The Index of banned books was not discontinued until the 1960s, and the Holy Office has merely been renamed "The Congregation for the Doctrine of the Faith," and it acts as a more genteel version of the heretic-burning office it once was, but its goal is the same: defending the Church's power.[20] The cost of admitting that one was wrong, especially on something so potentially damning as adding a poison to the water supply, is too high for most people and virtually all bureaucrats to contemplate. The rash and possibly dishonest decisions made fifty years ago will be enforced as long as there is the power to do so.

There was plenty of public uproar over fluoridation fifty years ago, but money not only talks in America, it dictates. Today, the average American has no familiarity with fluoridation's history or the fact that there still is no credible data that demonstrates that fluoridation reduces tooth decay, and overwhelming, indisputable evidence that fluoride is a deadly poison. The logic is that fluoride is good for the teeth at one part per million, but begins causing health problems at concentrations of less than two parts per million. Harold Hodge, one of fluoridation's pioneers and a toxicology expert, whose epidemiological research was influential in giving fluoridation the green light, himself stated that there should be at least a 100-fold margin in the dietary use of a potentially toxic agent.[21] The PHS adopted a two-to-one margin, although plenty of credible evidence shows that fluoride at one part per million (what most Americans drink) causes many health ailments, including cancer.

Reading the books for and against fluoridation can be illuminating. Two books that highlight the conflict are *Water Fluoridation, The Search and the Victory*, by Frank McClure, and *Fluoridation, The Great Dilemma*, by George Waldbott and two other scientists. McClure devotes the first quarter of his book to outlining some of fluoride's health hazards, including dental and skeletal fluorosis. If people read his book only to page 74, they might think that fluoride would be one of the modern world's greatest health hazards. The first words on page 75 are "By 1930 the time had arrived when epidemiological research was on the verge of demonstrating with unequivocal certainty the alliance between dental caries prevention and an optimum quantity of fluoride in public drinking waters." The rest of the book is a paean to the virtues of compulsory fluoridation. The book was published in 1970. What made McClure's statement bizarre was that it was not until 1931 that fluoride was considered the cause of tooth mottling. Before the dangers of fluoride to teeth were discovered, there was almost "unequivocal certainty" that fluoride was good for teeth.

With his statement of “certainty” about fluoride's benefits, McClure’s book was silent regarding some truly unequivocal issues of tooth decay. One unequivocal issue is that the civilized diet is almost solely responsible for tooth decay. Fossil evidence demonstrates that tooth decay began when civilization did, the Sumerians being one early example of significant tooth decay. In ancient Egypt, the upper classes had significant tooth decay, while the lower classes, eating simpler food, had very little.[22] In Silesia, located in present-day Europe (Germany, Poland, and Czechoslovakia), tooth decay was found in 1.75% of the population at the end of the Stone Age, versus eighty percent (up to 95% in some populations) in recent years.[23]

There is dramatic evidence regarding the civilized diet's pernicious influence on teeth, and especially refined sugar. Wherever Western civilization has made its appearance over the past several centuries, tooth decay and other health problems have followed in its wake. In the 1930s, Weston Price journeyed to earth’s last remaining “primitive” civilizations. Price studied primitive civilizations and what happened to them when introduced to the “civilized” diet. On average, the “primitive” peoples exposed to civilized diets experienced a 3500% (thirty-five times) increase in tooth decay, of the fourteen cultures he studied. Their dental arches also degenerated, leading to crowded teeth.[24] Western dentistry and orthodontics owe nearly their entire existence to processed food.

In keeping with the time-honored, male-dominated, capitalistic style of Western medicine, true prevention is not a concept. Instead of McClure advocating eliminating sugar and processed food from the diet to prevent tooth decay, a highly toxic waste byproduct of the aluminum processing and fertilizer industries, among others, becomes a miracle substance, compulsorily added to the water supply to “prevent” tooth decay. McClure and his friends not only kept the food processors in business, but they also helped create a new market for toxic waste.

That was not the only blind spot in McClure’s work. The possible economic incentive of the fluoride polluters, and those they bankrolled, was largely invisible. In light of recently declassified documents, and the now known corporate affiliations of McClure’s pantheon of fluoridation’s pioneers, McClure’s work today resembles a primer on the corruption of science.

The final chapter of *Water Fluoridation, The Search and the Victory*, deals with the opposition to fluoridation and how the pro-fluoridation forces triumphed. Particularly enlightening is McClure’s summary of a great fluoridation victory: the compulsory fluoridation of Ireland. McClure reprinted part of the judgment rendered by Justice Kenny. Kenny rejected the testimony of Waldbott and three other expert witnesses. The judge accepted wholly the testimony of Hodge, Yngve Ericsson, Armstrong and others. Armstrong would soon publicly admit the worthlessness of his early research. Ericsson was from Sweden, and was one of Europe’s biggest fluoridation proponents. Ericsson received money from the corrupt U.S. PHS, and even received royalties from Sweden’s toothpaste industry on fluoridation patents that he held.[25] Justice Kenny gave his reasons for rejecting Waldbott’s and the others' testimony. He said that their

views were fanatical, “passionate” and not supported by credible science. Kenny concluded that Hodge, Armstrong, Ericsson and the others from the fluoridation establishment were models of objectivity and learned reason, with the weight of science behind them. Knowing the now public but then secret bias of Hodge, the payola of Ericsson, and all their affiliations to the PHS, which was dominated by ALCOA for many years, the judge’s comments make for astonishing reading.

The hard science aspects surrounding the issue render water-fluoridation research highly suspect, if nothing else. The standard unit of tooth decay, known as DMF (decayed, missing, and filled), used by all fluoridation researchers, is far from bulletproof. In chapter 12 of *Fluoridation, The Great Dilemma*, the authors poke many and gaping holes in the research that supposedly supports compulsory fluoridation. One study showed that there was up to an 89% variation in cavities reported in a mouth, depending on which dentist performed the examination.[26] In the case of pro-fluoridation research, as with many others in the annals of science, it appears that the error rate may have been larger than the effect being studied, making the research worthless.

There is a mountain of contradictory data to the “unequivocal,” undebatable data that McClure lauded.[27] In looking at the data, it was interesting that just as death rates went down in the Western nations during World War II (and WW I, due to natural causes) as they were reduced to being vegetarians and growing their own food, their dental health also improved. Their general and dental health also unraveled after the war years, as they went back to their normal diets and abandoned their Victory Gardens.[28] It is odd that in America’s trial fluoridation experiments, the data at times showed an alarming increase in tooth decay after the war years, even though they were the new beneficiaries of artificial fluoridation. Even if it is accepted that fluoridation fights tooth decay, there are many results that show that “safely” fluoridated water still causes dental fluorosis. In Massachusetts, a 1974 study showed a 63% incidence of dental fluorosis in children in a fluoridated community.[29] In India, a study showed that 81% of the children had dental fluorosis with water at 0.73 PPM fluoride, less than that artificially added to fluoridated water supplies.[30]

There are many cases of people having toxic reactions to fluoridated water and even dying, but the fluoridation establishment has covered it up by intimidation and marginalization of scientists who speak out, including getting them fired, such as in John Yiamouyiannis' case.[31] Doctors and dentists who spoke out against fluoridation risked losing their licenses and other unpleasant fates. Smear campaigns, book-bannings, secret police tactics, official censure and a wide assortment of bedevilments awaited any doctor, dentist, or scientist who spoke out against fluoridation, not to mention an ever-shrinking funding pool for studying fluoride’s harmful effects. In the 1950’s, about half of all U.S. dentists did not believe in fluoridation, but dared not speak out.[32] If they did, a McCarthy-like witch hunt could be visited upon them.

There was controversy in the early days as Ewing and his pals were campaigning to get water fluoridated. Below is one of the few brave statements made by a medical doctor in standing up to the propaganda barrage, made in 1952 by a U.S. Congressman.

“Mr. Speaker, despite my best efforts, and from the evidence before my committee, I cannot find any public evidence that gave me the impression that the AMA, the Dental Association [ADA - Ed.], or several other health agencies, now recommending the fluoridation of water, had done any original work of their own. These groups were simply endorsing each other's opinions.

"You will note that all of the experts grounded in the science of bio-chemistry have advocated the go-slow sign on the use of fluorides in drinking water. I believe that the dental profession and other public-minded individuals. like myself, have been misled by the PHS, because all of the facts have not been made available upon this subject."

"…I sometimes wonder if the Aluminum Company of America and its many subsidiary companies might not have a deep interest in getting rid of the waste products from the manufacture of aluminum, because these products contain a large amount of fluoride. In this connection it is interesting to know that Oscar Ewing, who now heads up the Federal Security Administration, and the firm of attorneys he was with - Hubbard, Hill and Ewing - represents the Aluminum Company of America."[33]

In the fluoridation issue, the same conflicts of interest and corruption that pervade organized medicine are clearly seen. The AMAhas never has had much to do with promoting the public’s well being, instead promoting cigarettes and helping to cover up health disasters. That dynamic can also be found in the American Dental Association (ADA), where its financial relationship with candy companies is similar to the relationship the AMA had for generations with the tobacco interests. In 1995, the ADA received 15% of its money from trade groups such as the Sugar Association, Coca-Cola, and M & M. The ADA actively promotes compulsory fluoridation. The ADA was also guilty of stating that the ACLU endorsed fluoridation when it in fact did not.[34] Since 1993, the ADA has had to drop many organizations from its list of fluoridation supporters, including the EPA.[35]

In David Kennedy’s *How to Save Your Teeth* he devoted chapter seven to the fluoride issue. Kennedy is a dentist and so was his father. Kennedy grew up believing the fluoridation propaganda. His eyes were opened when he read of a three-year-old child dying from a fluoride treatment in 1974. A typical dentist’s treatment is to apply topical stannous (tin) fluoride gel to the child’s teeth, then have the child drink water, swish it around in his/her mouth, then spit it out. That is similar to the “swish” fluoride program that was popular in fluoridation’s early days.

The three-year-old boy, on his first trip to the dentist, was handed the water by the dental hygienist, who did not tell him what to do. The child swallowed the water. The fluoride gel on his teeth went into his stomach, three times the dose necessary to kill him. The child immediately began vomiting and complaining of dizziness and headaches. The dentist downplayed the child's reaction, saying that his fluoride treatment was normal. The mother was not comforted by the dentist's assurances, and was sent to a pediatric care unit in the same building. The care unit ignored the mother's frantic pleas to attend to her son. For more than two hours she waited for somebody to attend to her son as he lapsed into a coma. When the medical staff finally got around to seeing the son, they injected adrenaline into his heart and he was rushed to a hospital, where they waited for another hour. The boy again lapsed into a coma, then the doctors attempted to pump his stomach and he died of cardiac arrest. The boy's parents were eventually awarded $750,000.[36]

The only mistake was the boy swallowing the water instead of spitting it out. Dental industry apologists have said that the procedure was not quite orthodox, and the boy was told to spit out the water, which is a weak defense.[37] Kennedy began looking into fluoridation, and found no credible data supporting fluoridation. Today he is one of fluoridation's leading opponents.

Something really happens to teeth when exposed to fluoridation. Artificial fluoridation at 1 PPM appears to induce the early stages of dental fluorosis. Fluoridation's proponents tout the effect of hardening the enamel. That hardening appears to take place. What does that hardening represent? In metallurgy and the forging of metals it is well known that when metals are made harder, that often makes them more brittle. That may be exactly what is happening to teeth that are exposed to fluoride. Yes, the enamel gets harder, but it also becomes more brittle. The hardening is only the first stage of fluorosis. The next stage is that the brittle teeth begin mottling, chipping and disintegrating. The process does not prevent cavities from forming, and makes cavities more catastrophic to the teeth than they would otherwise be.

For argument's sake I will accept that fluoridation is indeed a boon to the teeth, and cavities decrease when fluorine is introduced to the body, and there is a health benefit to ingesting fluorine, although fluoridation's proponents say that those benefits mainly apply to children. Let me be even more optimistic and say that *everybody* benefits from fluorine. Let me be the greatest believer in fluoride's benefits and state that *every tooth* benefits from fluoride. Even if I was fluoride's biggest cheerleader, I still have to admit that dental and skeletal fluorosis exists. People's teeth and skeletons disintegrate when exposed to too much fluoride, denied by nobody. The other documented health hazards I will ignore for the moment as unsubstantiated.

Numerous studies show that dental fluorosis occurs in people exposed to only one part per million fluoride in the water supply. Yet, let me call fluoride a medicine. Let me consider fluoride similar to penicillin, as far as how universally wonderful it is for us. Some people should not take penicillin because they have adverse reactions. Similarly, some people are far more sensitive to fluoride and have reactions to it at levels that

most endure with no obvious harm. Millions of Americans today have that problem. That situation is typical of most drugs. How can I measure how much fluoride is in the rest of my ingestion, such as from my food, my toothpaste, and my dentist's fluoride treatments? If I were a doctor, prescribing penicillin to my patients (similar to a dentist and fluoride treatments), how would I feel if they also had penicillin in their food, water and toothpaste? Could I effectively control their overall dose of penicillin? There is not a sane doctor who would prescribe a medicine to the entire population, and in such a way that he/she could not tailor the dose for each patient. Nevertheless, that is what compulsory fluoridation does.

Using even better logic than fluoridation's proponents, people theoretically cannot overdose on vitamin C. Why not compulsorily add vitamin C to America's water supply? It could only help our health, could it not? One problem is there is no cheap source of vitamin C, whereas fluoride has the marvelous distinction of being a toxic waste byproduct of several industries. Today, the fertilizer industry has beaten out the aluminum refining industry as the source of fluoride in America's water supplies, as they provided the fluoride ion more cheaply. Today, 90% of fluoride added to America's water is in the form of fluosilicic acid, mainly provided by the phosphate fertilizer industry. In 1983, Rebecca Hammer of the Environmental Protection Agency (EPA) endorsed adding fluosilicic acid to the water supply, because it killed two birds with one stone. In Hammer's words,

"In regard to the use of fluosilicic acid as a source of fluorides for fluoridation, this Agency regards such as an ideal environmental solution to a long-standing problem. By recovering by-product fluosilicic acid from fertilizer manufacturing, water and air pollution are minimized, and water utilities have a low-cost source of fluoride available to them."

Instead of having to undertake costly measures to dispose of the hazardous waste, adding it to the water supply reduced both the costs of hazardous waste disposal and our medical bills. If only all industrial waste problems could find themselves in such a win-win situation.

Today, well more than half of American children have dental fluorosis, to some degree, and the rate is greater than 80% in some fluoridated areas. Millions of Americans have already had their teeth ruined by dental fluorosis, leading to dental work, up to and including dentures. Fluoridation promoters have continually minimized dental fluorosis as a mere cosmetic problem, but the facts are something else. When cancer patients have chemotherapy and their hair falls out, it is indicative of far more widespread tissue damage, hair falling out being the least of it. Similarly, dental fluorosis is merely the visible evidence of systemic fluoride poisoning. Ironically, research (even mainstream

research, by the National Institute of Dental Research) has shown that dental fluorosis *increases* tooth decay, and does not decrease it.[38]

Although reverse osmosis removes about 90% of the fluoride, and steam distillation removes well over 99%, people can still absorb it through their skin while in the shower and through other contact. I have consumed purified water for more than twenty years, avoiding not only fluorine, but also chlorine and other pollutants. Actively putting fluoride into the water supply has helped create an industry that removes it.

The long-term effect of fluoridation is increasing a dentist's business. The teeth still get their cavities, but when a dentist attempts to repair a tooth that has been fluoridated, the tooth has disintegrated to the point where a simple filling will not suffice. The tooth begins coming apart as the dentist works on it. Instead, the tooth gets a crown or other more extensive repair. Dentists have remarked on that phenomenon for many years.

Harold Hodge, the Nuclear Connection, and Our Brains

Harold Hodge's career is worth investigating. He was the leading scientist who created the data showing fluoride's harmlessness in the doses they planned to administer to the nation's water supplies. In the late 1990s, Joel Griffiths and Christopher Bryson unearthed documents regarding Hodge's involvement in acts that are crimes against humanity. To better understand the situation, this essay will need to revisit chemistry, fluorine and the atom bomb.

Du Pont invented Freon early in the 20th century. During World War II and America's secret pursuit of the atom bomb, there were many technical hurdles to overcome. A major problem was obtaining the material to do the job. In nature, uranium exists in two basic isotopes. An isotope is a version of an element. What makes one isotope different from another is its number of neutrons. In nature, Uranium is found as Uranium 238 (U-238) and U -235. U-238 is by far the most abundant isotope, comprising more than 99% of all uranium. U-235 is less than one percent of naturally occurring uranium, but it is the isotope needed to make a bomb. The difference between U-235 and U-238 is three neutrons. Those three fewer neutrons make U-235 less stable (undergoing radioactive decay into more stable elements) than U-238. U-235's half-life (the time it takes for half of it to decay) is 700 million years, but that is short compared to U-238's 4.5 billion years. It is short enough to lump it together and create a nuclear chain reaction. That chain reaction is the required event for making nuclear weapons and nuclear energy possible.

How does one separate U-235 from U-238? The answer was simple and the key to making nuclear weapons. Du Pont was the acknowledged master of refrigeration, and using fluorine to make a refrigerant was their specialty. The secret to separating the uranium isotopes was somehow turning uranium into a gas, and uranium hexafluoride was born, which is one uranium atom bonded to six fluorine atoms. It is the only known

uranium compound that is a gas at near environmental temperatures (its boiling point is 134° F). It is called “Hex” in the industry. From this essay’s chemistry lesson addendum, it should be obvious why that compound had such a low boiling point. Hex is uranium gas, or one could call it radioactive Freon.

Here is how they separated it. The Hex of U-235 is slightly lighter than Hex of U-238 because of those three neutrons. What Manhattan Project personnel did was send Hex through a mile-long tunnel filled with screens. As the Hex made its way to the end of the tunnel, the Hex, U-235 rose in comparison to the Hex, U-238, because it was slightly lighter. A membrane then filtered it out. It was an ingenious solution. They accumulated the U-235 an atom at a time. The work of tens of thousands of people was directed at getting a lump of U-235 that I could hold in my hand. That was the active ingredient in the atom bomb dropped on Hiroshima.

Du Pont produced the fluorine for the Hex. They were making vast amounts of it. During 1944 there was an accident at du Pont, and a cloud of deadly hydrogen fluoride was released into the air. When added to water, hydrogen fluoride becomes hydrofluoric acid, one of the most dangerous acids known.[39] There were probably numerous releases.[40] The fluoride clouds sailed away to farms downwind. Crops withered, and people and animals became violently ill. The affected farmers in Gloucester and Salem counties, famous for their high quality produce, sued the federal government after the war. They were stifled in their lawsuits against du Pont and the Manhattan Project, largely because all the data regarding the damage done was kept secret in the interest of “national security.” The farmers eventually gave up and settled their suits for a few hundred dollars per farm. Recently declassified documents show Harold Hodge’s active role in the government’s damage control effort. In a secret Manhattan Project memo dated March 1, 1946, Hodge, who was the Manhattan Project’s chief toxicologist for fluorine studies, wrote to the Manhattan Project's medical division chief, Colonel Stafford Warren. Hodge expressed his concern regarding the toxicity of fluorine and the New Jersey incident. Hodge outlined four major areas of concern:

"1. A question of injury of the peach crop in 1944.

"2. A report of extraordinary fluoride content of vegetables grown in this area.

"3. A report of abnormally high fluoride content in the blood of human individuals residing in this area.

"4. A report raising the question of serious poisoning of horses and cattle in this area."

Shortly after the farmers sued, the federal government mobilized tremendous resources to counteract the farmers' efforts. Secret meetings were held in Washington DC, attended by everybody from the FDA to the Bureau of Standards to the Justice Department. Why were they meeting? In a recently declassified memo from Colonel Cooper Rhodes of the Manhattan Project, those government agencies were “making scientific investigations to obtain evidence which may be used to protect the interest of the Government at the trial of the suits brought by owners of peach orchards in ... New Jersey.” If the farmers prevailed in court, America’s entire nuclear program could have been threatened.

Hodge also wrote to his boss, "Would there be any use in making attempts to counteract the local fear of fluoride on the part of residents of Salem and Gloucester counties through lectures on F toxicology and perhaps the usefulness of F in tooth health?" “F” stood for fluoride, and was the name of the top-secret program begun during those days to study the harmful effects of fluoride. “Project F” was performed at the University of Rochester. The University of Rochester is already infamous for other “research” it was performing at the same time for the Manhattan Project: they secretly injected people with plutonium without their knowledge, in the first of many guinea pig experiments performed on U.S. citizens to test chemicals and radiation. Over a thirty-year period, the U.S. government administered everything from plutonium to LSD to unwitting “subjects.” Those are only the experiments that have been made public.[41] God only knows what other experiments will remain hidden.

Studying the decision-making process that led to dropping the atom bombs, the CIA’s hiring of Nazis, the U.S. military shenanigans, and the activities of the alphabet soup U.S. “security” organizations regularly elicits amazement at how much information is still being kept secret, documents that are more than fifty years old. A researcher discovering a newly declassified document can discover other classified documents. The first document seen can be revealing, but what can be more intriguing are other documents referred to by the original document. When the researcher tries finding the referred document, he/she can find it still classified.

Apologists for the secrecy, such as UFO debunker Phil Klass, say that there are legitimate national security reasons for keeping 100% of the information secret that the National Security Agency has on UFOs, for instance.[42] Ex-CIA agent Ralph McGehee, whose bitter experience makes it clear that the government nearly never has a legitimate “security” reason for keeping anything classified, refutes the opinions of establishment apologists. McGehee is far from alone. In a recent interview, ex-CIA operative Mark Phillips stated that the 1947 National Security Act had nothing to do with protecting national security. Phillips stated that everybody who worked under it knew that its true purpose was to “cover crimes. It was not to cover secrets.”[43] Secrecy and deception (lies of omission and commission) are the handmaidens of self-serving activities, as a cover for dark deeds or in keeping the grip on power and wealth for a select few.

Griffiths and Bryson's work regarding the fifty-year-old fluoridation research ran into the "national security" obstacle.[44] Hodge was involved with promoting fluoride *before* the New Jersey accident in 1944. In 1943, Hodge chaired the committee that decided the feasibility of fluoridating the water supply of Newburgh, New York, one of two American cities first targeted for artificial fluoridation. The committee was eventually composed of other Manhattan Project people, such as Henry Barnett and John Fertig. The Manhattan Project affiliations of Hodge, Barnett, and Fertig were kept secret. The wolves were looking after the interests of the sheep. Trendley Dean himself was opposed to the Newburgh test, fearing fluoride's toxicity. Manhattan Project personnel, led by Hodge, covered up Dean's opposition.[45] The man in charge of the Newburgh fluoridation project was David Ast; another fluoridation legend who attended the secret Manhattan Project meetings regarding the New Jersey accident, according to recently declassified documents.

The situation was so skewed that the Program F scientists published a 1948 paper that ran in the *Journal of the American Dental Association*, describing the health effects on humans. Griffiths and Bryson obtained the original report, now declassified, and found that the Atomic Energy Commission censored the harmful health effects that were documented. The censorship was so severe it was funny, in a sick way. Griffiths and Bryson wrote:

"This was a study of the dental and physical health of workers in a factory producing fluoride for the A-bomb program, conducted by a team of dentists from the Manhattan Project. The secret version reports that most of the men had no teeth left. The published version reports only that the men had fewer cavities. The secret version says the men had to wear rubber boots because the fluoride fumes disintegrated the nails in their shoes. The published version does not mention this. The secret version says the fluoride may have acted similarly on the men's teeth, contributing to their toothlessness. The published version omits this statement. The published version concludes that 'the men were unusually healthy, judged from both a medical and dental point of view.'"

Animals avoided the facility where the hydrogen fluoride was used. All microorganisms were killed, so food left in the facility would never decay. The hydrogen fluoride etched the facility's windows and the workers' glasses, so they needed to be continually replaced. The workers also developed lesions and a type of "sunburn" from working there. Nearby elementary schools had their windows etched from hydrogen fluoride releases.

Hodge was dead when Griffiths and Bryson discovered the damning declassified documents, but Ast was still alive and was named in the documents as active in the nuclear establishment's damage-control efforts. Ast oversaw the Newburgh New York fluoridation experiment. Griffiths and Bryson confronted Ast with the declassified

documents' revelations. Ast pulled a Ronald Reagan, claiming no recollection of those activities.

There were major studies performed by the government on fluorine during those World War II days and shortly thereafter. With the exception of the recently declassified version of the report published in *JADA* in 1948, the others are still classified, despite significant efforts by Griffiths and Bryson to get them declassified using the Freedom of Information Act. One entire area of study still classified is that regarding the effects of fluorine on the central nervous system. Recently declassified memos show that on April 29, 1944, Colonel Warren approved a Central Nervous System (CNS) research proposal. Hodge wrote the proposal. The memo accompanying the proposal said:

"Clinical evidence suggests that (uranium hexafluoride) may have a rather marked central nervous system effect with mental confusion, drowsiness and lassitude as the conspicuous features. It seems most likely that the F [code for fluoride] component rather than the T [code for uranium] is the causative factor."[46]

The proposal remains classified, as do the research results. Another declassified document dated six months after the proposal orders the research stopped. That sent my head spinning. Right-wingers have been saying for more than fifty years that fluoridation was a plot to numb American brains so they could be easily herded. I had heard for years that fluoride administered to a bull made it docile and easy to handle. I have read repeatedly that both the Nazis and Soviets used it in their prison camps to keep the prisoners' brains numbed, to make them docile. In his right wing classic *Murder by Injection*, Eustace Mullins made the case that Alzheimer's disease is largely caused by the ubiquity of aluminum and fluorine in the nation's food and water supply. There is increasing evidence for that opinion.[47] Mullins mentioned the Soviet studies from 1940 showing how fluorine in the water supply was helpful in running their Gulag system, with brain-numbed prisoners, attested to by others.[48]

In the appendix of *Murder by Injection* Mullins presents a frightening fluoridation story. At the end of World War II, as the United States was scrambling to snatch up as many Nazi scientists as possible and keep them from the Soviet Union's clutches, American industrialists were sent to Europe to perform many duties, including mopping up German Industries. One prominent scientist sent over was Charles Eliot Perkins. His job was to help take over the I.G. Farben chemical plants. I.G. Farben was the most infamous and largest of the German cartels. Farben ran the rubber factory at Auschwitz that was staffed by concentration camp labor. Farben also made the Zyklon-B gas used in the gas chambers.

In a letter Perkins wrote on October 2, 1954 to the Lee Foundation for Nutritional Research, Perkins made the startling statement that a German chemist, who was a

prominent Nazi, told him that the German General Staff had approved a comprehensive population control plan to use on subject populations. It amounted to mind control, and an essential plan element was to "medicate" the water supplies, mainly with sodium fluoride. Perkins wrote,

"However, I want to make this very definite and very positive - the real reason behind water fluoridation is not to benefit children's teeth…The real purpose behind water fluoridation is to reduce the resistance of the masses to domination and control and loss of liberty." Perkins said that putting fluoride in the water supply eventually numbs the brain, making people easily manipulated. Perkins stated "…any person who drinks fluoridated water for a period of one year or more will never again be the same person, mentally or physically."[49]

One friend remarked, when he heard the history of fluoridation, that at least the Soviet Union and Nazis used it or intended to use it on prisoners. In the United States it is used on the general population.

The above revelations open a Pandora's box regarding the mental effects of fluorinated drugs and chemicals. Freons have psychoactive effects, and is the tip of the iceberg regarding fluorinated drugs and chemicals. The Germans were leaders in such research. During World War II the Germans invented the first nerve gas, Soman. It is a fluorinated chemical. In 1939, the scientists at Farben invented Sarin, the most deadly nerve gas next to VX. Sarin is an acronym of the initials of the Farben scientists who developed it. Sarin was going to replace Zyklon B in the gas chambers, but the war ended before mass production could begin. Sarin is also a fluorinated chemical, a close cousin of Soman, and the EPA recently published a chemical profile on Sarin, after Gulf War Syndrome veterans (who think that Sarin may be responsible for their disease) pressured the government, showing that the fluorine atom was its active ingredient.[50]

Rohypnol, the notorious drug used in date rapes, is fluorinated Valium, making it more than twenty times as potent as normal Valium. Prozac is another fluorinated drug. In all, there are hundreds of fluorinated drugs, and many have profound mental effects, including memory loss. The primary effect of psychoactive drugs is inhibiting enzyme production, which the fluorine ion is well known to do. In light of other facts surrounding fluoridation, this begins treading frightening territory. Fluoridation promoters and others often laugh off such situations as the workings of hopelessly paranoid minds. In light of declassified memos regarding U.S. CNS experiments of fifty years ago (at nearly the same time the Nazis and Soviets were doing similar kinds of experiments), *and* the studies that are performed across the world on fluoridation and intelligence, I am not laughing. Recently two studies in China showed a drop in IQ of children exposed to fluoride in the water supply of between 5 and 19 points.[51]

In other unsettling revelations, documents have surfaced which revealed that when the Newburgh New York fluoridation trials were run, testing fluoride's mental effects on the subject children was planned, and tissue samples were secretly tested at the University of Rochester. The results of those tests have yet to be made public.

In Mullins' book he chalks up the fluoridation push as a mind-control ploy by the "Rockefeller Syndicate." Mullins says that the Rockefellers paid Ewing's astronomical salary at ALCOA in order to set up his tenure at the Federal Security Agency. The Rockefeller name has come up repeatedly in the area of social control in my studies. John Taylor Gatto is a two-time New York City Teacher of the Year. Gatto taught for twenty-six years in inner city New York. Gatto is an anomaly in teaching. He is widely recognized as one of the best teachers America has to offer, but he is highly critical of our educational system. In 1992, he wrote*Dumbing us Down*, a monograph he published after retiring from the New York City school system. *Dumbing us Down* is a devastating critique of America's compulsory school system, and how it beats the humanity out of children and "dumbs us down."

Gatto has become an education activist since he retired from the New York City school system. In *Dumbing us Down* is the speech he gave when he accepted the 1990 Teacher of the Year award, winning the award for the second consecutive year. Gatto identified two men, Sears and Harper, as primary designers of our modern schools, which he states are "instruments of scientific management of a mass population."[52] Sears and Harper were from the University of Chicago, an institution that John Rockefeller rebuilt at the turn of the century. Rockefeller and Andrew Carnegie also took over American medicine a century ago, leading to the knives and drugs paradigm that dominates Western medicine today.

It is easy to become lost in bureaucratic and statistical tangles, losing sight of the bigger picture. Our nation was pursuing the most destructive technology of all time, and the first practical application of it was dropping bombs on women and children, then publicly lie about who it was dropped on and why.[53]

Dr. Phyllis Mullenix, a toxicologist at Children's Hospital in Boston, who also worked in neuropathology at Harvard Medical School, recently performed research into fluoride and the intelligence of rats. In 1982 she was asked to perform the research as part of her studies on the toxicity of therapeutic agents used in treating leukemia and other diseases. Mullenix was invited to work at the Forsyth Dental Center, arguably the world's leading dental research institute. Five years later, her research was underway.

Mullenix found a significant diminishment of rat intelligence when they were subjected to fluoride in their water supply. During Mullenix's research, she was surprised that there were virtually no published studies regarding fluorine and its effects on the human brain.

Some interesting news was the help she had. Brought in as a consultant on Mullenix's research was Harold Hodge. He was quite old in the early 1990s. During Hodge's consulting of Mullenix's work, he never mentioned the CNS studies that he proposed

fifty years earlier. He almost certainly oversaw the 1940s research himself. When shown the newly declassified memos that clearly spell out Hodge's active role in CNS research on fluorine, Mullenix said she was "flabbergasted." Mullenix eventually came to see Hodge as a "monster" who actually steered her research toward studying fluoride effects on the central nervous system, probably to see what the results would really be, as the CNS experiments from the 1940s apparently were prematurely terminated. Mullenix today feels that Hodge and one of his University of Rochester pals used her "like a little puppet."[54] When Mullenix tried interesting the NIDR in the declassified memos, she was rudely treated like a "crackpot." The NIDR is evidently part of the U.S. government's damage control effort on fluoride's harmful effects.

When Mullenix read the declassified study on fluorine and the dental health of Manhattan Project workers and compared it to the originally published version, she said, "This makes me ashamed to be a scientist." Mullenix wonders if all other studies done on fluoridation safety were done like that one. Only the federal government knows for sure, in its secret archives.[55]

Mullenix is one more casualty of the fluoride wars. She had nothing to do with the fluoride issue originally, but became involved as part of her work, when steered into it by Hodge. All she "knew" about fluoride when she started was that it was supposedly good for teeth. She did not initiate her research, but was doing it because she was asked. Her research results were published in*Neurotoxicology and Teratology* (Vol.17, No. 2, pp.169-177, 1995), the leading scientific journal in the field. Before that paper was published she presented her findings at the NIDR in Maryland, a division of the National Institute of Health (NIH). When she arrived at the NIDR, in her words, "I had no idea what I was getting into. I walked into the main corridors there and all over the walls was 'The Miracle of Fluoride'. That was my first real kick-in-the-pants as to what was actually going on." She said the display ridiculed people who were against fluoridation. "I thought, 'Oh great!' Here's the main NIH hospital talking about the 'Miracle of Fluoride' and I'm giving a seminar to the NIDR telling them that fluoride is neurotoxic!"[56] After her presentation she met with toothpaste representatives who asked her if she was saying that their products lowered the IQs of children, and Mullenix responded with, "Basically, yes." That marked the end of her career.

When she excitedly announced to her employers that her paper on the intelligence of rats was being published, three days later she was fired. Her employers asked her which journal was going to publish her work. By that time, she realized that they wanted to block its publication, so she did not tell them. Subsequently, funding has dried up for that kind of research, although immediately after Mullenix was fired, Colgate gave a $250,000 grant to Forsyth (for a job well done?). The unique equipment Mullenix developed to test rat intelligence was mysteriously destroyed before she could recover it.

Dr. Mullenix was then given an unfunded research position at Children's Hospital in Boston, but with no equipment or money. Mullenix said, "The people at Children's Hospital, for heaven's sake, came right out and said they were scared because they

knew how important the fluoride issue was…Even at Forsyth they told me I was endangering funds for the institution if I published that information."[57]

Mullenix has since applied to the NIH for a research grant to further her research, and was turned down. The NIH told her that fluoride had no central nervous system effects, period. How the NIH concluded that, when virtually the only published research shows deleterious effects, is curious indeed. The work Mullenix did, as well as other recent studies, has shown that the fluoride ion is particularly damaging to the brain's hippocampal region, which is its learning center.[58]

Mullenix's fate is common, and this web site documents many instances of scientists and others arriving at the "wrong" answers, and having their careers destroyed. Other scientists who had their careers ruined for coming up with the "wrong" answer regarding fluoridation include Dr. Allan S. Gray of British Columbia and Dr. John Colquhon of Auckland, New Zealand.

In light of Hodge's secret work for the Manhattan Project, and the secret memos and secret studies that are the tip of the iceberg, every pro-fluoridation effort that uses Hodge's name is tainted. It was with interest that I read *Fluoride and Dental Caries*. It is a relatively recent book on the subject, published in 1986. The book is a compendium on fluoridation, drawing on various experts in the field. Hodge co-wrote a chapter on fluoride toxicity, and also wrote a chapter dealing with objections to fluoridation. Reading that book was another enlightening process, when I recovered from my anger. The book gives the appearance of looking at fluoridation from many aspects, but *appearance* is the operative word. Hodge's work is suspect, to put it mildly, and I looked there first.

Hodge's co-author on the toxicology chapter was another fluoridation luminary: Frank Smith from the University of Rochester. Smith co-authored many works with Hodge and was active in producing/massaging data to protect industry and government from liability claims.[59] It is instructive to see the blind spots in their work, and what they were obviously hiding. When Smith and Hodge stated that "No substantive evidence of ill health has ever been offered in children or adults as a result of consuming drinking water containing optimal concentrations of fluoride,"[60] they were voicing the nuclear establishment's damage control opinion, because there is substantial evidence of harm, but they chose to ignore it. When they wrote, "Since the Danish experience (in the 1930s) crippling fluorosis in an industrial setting has never been seen in the United States or Europe,"[61] a grain of salt needs to be taken with that statement. With just one declassified study, out of many that exist and are still secret, definite harm occurred, although by playing semantics games they were not "crippled," merely toothless, although the long-term effects are unknown, which may be in another classified study. People becoming violently ill from du Pont's fluoride cloud are invisible victims, at least to the public, when Hodge and Smith wrote their masterpiece of disinformation. The worst air pollution disaster in U.S. history happened in October 1948 in Donora, Pennsylvania, when an air inversion layer formed over the town for four days, and fluoride emissions from U.S. Steel's zinc and steel facilities killed twenty

people and seriously injured hundreds more. If the inversion layer had lasted one more day, a thousand people may have died. U.S. Steel and the PHS conspired to cover-up the disaster, with records missing to this day.[62]

Throughout *Fluoride and Dental Caries* there were instances of “looking” at objections to fluoridation, and the *appearance* of carefully considering them was undertaken. The close relationship between ALCOA, the other fluoride polluters and the early fluoridation researchers is nowhere mentioned, although it is well documented and is consistently one of the biggest issues raised by fluoridation's opponents. A table on the “anti-science” arguments against fluoridation was produced on page 130, in a chapter titled “Legal, Social and Economics Aspects of Fluoridation,” that even mentioned the “Communist conspiracy” aspect of fluoridation. Nowhere was mentioned the obvious economic incentives of fluoride polluters to manage the fluoridation issue, and the well-documented instances of them funding and influencing the fluoridation research, even when it is merely the smoking gun of conflict of interest. The authors of that chapter, including the book’s editor, used the words “pseudoscientist” and “quack” to describe fluoridation opponents and their “anti-science.” In the chapter purporting to look at the broad spectrum of issues regarding fluoridation, the ALCOA and fluoride polluter issue was spectacularly absent.

In *Fluoride and Dental Caries,* one area caught my interest. In Hodge’s chapter on fluoridation objections, he presented experimental evidence by chemists that showed the fluorine ion benign to human chemistry. The research was used to discredit John Yiamouyiannis, who uses the very same research to show how the fluorine ion wreaks havoc in the body. Hodge interpreted the original research, qualifying and minimizing the conclusions, and then he presented the experimental work of pro-fluoridation pal Armstrong. Hodge concluded that the research showed that the fluorine ion was relatively harmless by itself. It was the first time that I had seen Yiamouyiannis' science challenged, beyond his cancer statistic analyses with Dean Burk. With knowing Hodge’s extreme and formerly secret bias, I cannot trust his writing, particularly regarding the fluoride ion and human harm, but it was interesting reading. When anybody is proven a systematic liar, how can anything they say be believed? How can fact and fiction be separated? The only way I know is to entirely reject their work and become my own expert.

Here are some quotes regarding the biological damage the fluorine ion does to human health, the kind not found in pro-fluoridation propaganda such as *Fluoride and Dental Caries*.

"Fluorides are general protoplasmic poisons, probably because of their capacity to modify the metabolism of cells by changing the permeability of the cell membrane and by inhibiting certain enzyme systems. The exact mechanism of such actions is obscure." -***Journal of the American Medical Association*, Sept 18, 1943. (before the propaganda steamroller really got going in 1947)**

"The fluoride ion exerts its toxic effect by inhibiting the action of many enzyme systems." - **Hugo Theorell, M.D., Nobel Prize winner for his research in the field of enzyme chemistry.**

"We ought to go slowly. Everybody knows that fluorine and fluorides are very poisonous substances and we use them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned; because enzymes are poisoned, and that is why animals and plants die." - **James B. Sumner, Director of Enzyme Chemistry, Department of Biochemistry and Nutrition, Cornell University, and a Nobel Prize winner for his work in the field of enzyme chemistry.**

"The data indicated that drinking water with as little as 1 PPM shortened the life span of mice an average of nine per cent. This was true whether death was due to cancer or non-cancerous diseases. The only notice proponents of fluoridation gave to this work was to discredit it as much as possible. ... In experiments where the drug was added directly to suspensions of cancer tissue before inoculation into eggs or mice, sodium fluoride stimulated the growth of cancer tissue in concentrations of one part in more than 20 million. Scientists at Cambridge University (*British Medical Journal*, Oct 26, 1963) discovered that concentrations of sodium fluoride as low as one part in ten million inhibited the growth of a culture of human tissue. ... the growing weight of scientific evidence that water-borne fluorides, even at 1 PPM, have toxic possibilities must finally be recognized." - **Alfred Taylor, Ph.D., Clayton Foundation, Biochemical Institute, University of Texas, Austin Texas, 1965.**

"The terrifying conclusion of the studies was that fluorine greatly induced a cancer tumor's growth. If doctors and the public can be made aware of this catastrophe, fluoridation shall end quickly. It will someday be recognized as the most lethal and stupid "Health Program" ever conceived by the mind of man, witch doctors and blood-letters not excepted."

"In 1969 the country of Sweden intended to fluoridate their water supply due to the strong advice of Professor Yngve Ericsson, a Swedish dentist who was also the senior representative on the World Health Organization's Expert Committee on Fluoridation. However, it was then found that Professor Ericsson coincidentally was the holder of two highly-profitable patents on fluoride toothpaste!" - **Alfred Taylor, June 13, 1970 the *Gothenburg Post* (Sweden); August 5, 1970 the *News Register* (Sweden); and May 1, 1970 *Norsk Folkehelselag* (Norway)**.

"In 1978, the West German Association of Water and Gas Experts rejected fluoridation for legal reasons, and because 'the so-called optimal fluoride concentration of 1mg/liter is close to the dose at which long-term damage to the human body is to be expected.'" - ***Chemical and Engineering News*, August 1, 1988.**

The tremendous blind spots regarding fluoride polluters, diet and caries, the severe biases regarding the harm done by fluorides, and Hodge's secret mission on behalf of the nuclear establishment rendered *Fluoride and Dental Caries* virtually worthless, except as an instructive exercise in propaganda. With the now-known nuclear industry's active though secret management of the fluoridation issue, books such as *Fluoride and Dental Caries* are examples of "pseudoscience" in the strongest sense.

The situation of industry and government corrupting science is far from confined to the fluoridation issue. Today, ethyl alcohol, the substance that every drunkard knows well, is added to American gasoline to increase its octane rating. It works great. It was also used eighty years ago. In the 1920s, ethyl alcohol was replaced by tetraethyl lead as an octane booster. Why? As it turns out, nobody could patent ethyl alcohol and make monopoly profits from putting it into gasoline. Therefore, General Motors, Standard Oil and du Pont conspired to make a new, patentable chemical, and tetraethyl lead was introduced into American gas tanks. AlthoughBen Franklin remarked on lead's well-known toxic qualities hundreds of years ago, and even ancient Romans and Greeks wrote of its toxic properties, industrially-funded scientists in the 20th century labored mightily to make lead appear safe to ingest, even though they knew how deadly tetraethyl lead really was. It is unknown just how many people became sick and died from the effects of lead being spewed into the air during the era of tetraethyl lead, but it is not inconsiderable. In 1985, the EPA estimated 5,000 lead-related heart disease deaths per year, prior to the tetraethyl lead phase out. The lead content of American bloodstreams has fallen precipitously since tetraethyl lead was outlawed.

The most notorious of the industrial laboratories that produced the lead "research" was Kettering Laboratories.[63] For generations, Kettering and its industrial sponsors controlled all lead research. The "Kettering" of Kettering Laboratories was Charles Kettering, the inventor and General Motors executive. Kettering Laboratories is not the only "medical" foundation that he helped bankroll. The Memorial Sloan-Kettering Cancer Center, the world's leading cancer research institute, is named after Kettering and his buddy, General Motors CEO Alfred Sloan, another noted "philanthropist." Kettering Laboratories was also instrumental in making aluminum appear benign. McClure had high praise for Edward Largent and Kettering Laboratories in his*Water Fluoridation: The Search and the Victory*. Largent and Kettering were involved in covering-up the harmful effects of fluoride, and Largent secretly worked for the federal government, possibly on the Manhattan Project.[64] Christopher Bryson unearthed original research that Kettering performed in the 1950s, which showed that inhaling airborne fluorides caused an emphysema-like condition, something that countless Americans downwind from fluoride facilities have suffered from. Kettering buried the research results because they came up with the "wrong" answer, but did not have "national security" to cover their tracks, so Bryson discovered it in his research.[65]

On a lighter note, here is a cartoon that sums up fluoridation, although it was a general-purpose cartoon dealing with similar corporate malfeasance. Replace the words "toxic sludge" with fluoride, and this cartoon sums up the story of fluoridation. Tom

Tomorrow is the funniest political cartoonist I have ever seen, and might be the best. The below cartoon was so inspired that a book was named after it.[66]

 Click on image to enlarge

Anne-Lise Gotzsche's *The Fluoride Question, Panacea or Poison?* is an excellent survey of fluoridation. She was a medical journalist in London who investigated fluoridation for years. She has a sensible attitude, taking both the pro and anti-fluoridation people to task when needed. The book is an easy read and covers the main issues surrounding fluoridation, although written before the more pernicious conflicts of interest of fluoridation's proponents were discovered. As with anybody who looks into fluoridation and is not on the payroll of a bureaucracy or corporation that promotes fluoride, Gotzsche demonstrated how shamelessly political the fluoridation effort was. Science was trampled in the rush to fluoridate. Many scientists went so far overboard that they became evangelists instead of scientists. Some began making up the science as they went along, such as the infamous Frederick Stare. Stare made up a new concept that he called "mineral nutrient fluoride," a pro-fluoridation idea so unfounded that even the PHS shot it down.[67] Fluoridation pioneer Basil Bibby even recommended adding *lead* fluoride to the water supplies in 1945. Gotzsche discussed that whatever the propaganda about helping teeth, dentists' business goes up in fluoridated areas, not down. By 1970, Newburgh, New York and Grand Rapids, Michigan, the recipients of the first trial fluoridation experiments, had twice the dentists per capita as the national average.[68]

Gotzsche said that calling groups engaged in the huge international push to fluoridate water the "dental mafia" was "naïve," but felt that those thinking that way could perhaps be forgiven, given the facts. Her book was published in 1975. In light of Harold Hodge's connections, "mafia" may not be far from the mark.

Conclusion

After looking into the fluoridation issue long and hard, here are my conclusions.

- Preventing tooth decay in children is the only rationale ever put forth by fluoridation's proponents. Tooth decay is unequivocally caused by processed food, and particularly by refined sugar. I have never seen anybody refute that who did not work for the sugar and food processing industries, and fluoridation's supporters always seem to ignore that issue.

- Instead of proposing that we eliminate most processed food from our diet as a way to eliminate tooth decay and the vast majority of American health problems, an industrial waste was added to the water supply as a "preventive."

- All data regarding the benefit of fluoridating the water supply is suspect. Many important variables were not accounted for, such as increasing dental hygiene in the West, other elements present in the water, the fluoride content that is already in food, the extreme variability as to what constitutes a cavity and so forth. Most of fluoridation's proponents worked for or were affiliated with the Public Health Service, which was dominated by agents of fluoride-polluter ALCOA during the years that the seminal research and political action was carried out. Other private foundations that performed original and influential fluoride research, such as the Kettering Laboratory at the University of Cincinnati, also turn out to have been bankrolled by fluoride polluters. No doubt, many conflicts of interest are still hidden. The recent revelations of Harold Hodge's relationship with the nuclear establishment, and their motivation to prove fluoride safe, cast grave doubts on the reliability of *all* pro-fluoridation research results published after 1942, which includes *all* studies regarding the results of artificial fluoridation. The ALCOA/Mellon-connection casts a shadow across much of the pro-fluoridation research performed before 1942. Water fluoridation induces dental fluorosis in many, if not most, people subject to it. The first stage hardens the enamel, coinciding with making it more brittle. Then the slow disintegration of the teeth ensues.

- The data regarding the harm fluorine does to teeth and human biology is unequivocal, denied by nobody in the debate. What the proponents argue is that a substance well known to cause adverse health effects at two PPM, is not only safe but good for people at one PPM. In health science history there may be no instance with such a small window of health promotion/health destruction for a "health" additive. Even one of fluoridation's greatest proponents, Harold Hodge, stated that a margin of 100-fold should be the minimum-sized window for beneficial/toxic food additives when he was not being a fluoridation propagandist. There is a great deal of suppressed evidence of the harm that 1 PPM fluoridated water causes, and even harm at concentrations of far less than 1 PPM.

- Scientists and doctors who have either witnessed the adverse health effects of artificial fluoridation or campaigned against it have been silenced. Often they are simply ignored or denied access to the mainstream media to make their cases, which is common for anybody who challenges mainstream dogma. There is also a clear pattern of active attack, such as what happened to John Yiamouyiannis, Phyllis Mullenix, William Marcus and many others. Scientific and medical inquisitions are standard behavior where wealth and power are affected.

- In light of recent studies on fluoridation and intelligence, nobody can easily dismiss the opinion of right wing activists that fluoridation is part of a mind control program. With recently declassified documents showing the United States performing extensive research on fluoride and the central nervous system, research that is still classified fifty years later, anybody who drinks fluoridated water or uses fluoridated toothpaste has every reason to be alarmed. In finishing

this summary, and seeing how the nuclear establishment and large industries have managed the "science" of fluorine, we may not be able to trust *any* radiation research that the nuclear establishment has produced on its effect on humans, something that John Gofman has written extensively about. In disturbing instances, the same organizations that managed the "fluoride problem" also managed the "radiation problem."

- The good news is that there have been some significant victories. For one thing, the vast majority (95%) of humanity does not drink artificially fluoridated water. The largest populations subject to compulsory fluoridation are England and its former colonies, such as Ireland, Canada, Australia, New Zealand, and the United States. U.S. citizens consume nearly half of the world's fluoridated water. Europe's population is less than two percent fluoridated, and many places have stopped fluoridating their water supplies, while others have successfully resisted having fluoride added to their water, including American and Canadian cities. EPA scientists spoke out against fluoridation in the late 1990s. There are many sources of fluoridation information on the Internet. I am one of many people writing about fluoridation. There are many scientists and others waging political action today to end the insanity of fluoridation, and they need all the help they can get. We all will determine whether we keep drinking poison every day. It is up to all of us.

In ending this essay, it comes down to common sense. Tooth decay is primarily caused by our diet, and changing our diet is the only effective solution. Adding a well-known poison to the water supply to "prevent" tooth decay is not only insane, but also suicidal. It also has "coincidentally" been a windfall for fluorine polluters, both corporate and governmental. Instead of having to bear the huge costs of disposing of their highly toxic fluoride waste, large corporations now can sell it to water suppliers and toothpaste manufacturers! Fluoridation may also be part of a mind control program. The history of fluoridation is a horror story. Most people subject to fluoridation have no idea of its dark history, demonstrating how effective our propaganda and indoctrination systems are. Walk into an average grocery store and try finding toothpaste that does not have fluoride in it (I have been queried repeatedly on this issue; Americans can find non-fluoridated toothpaste in health food stores…for now).

Many people discussed why Orwell's dark prophecies were wrong, and why *1984* did not happen. The irony is that it appears as if we *are* living in Orwell's world today. The fluoride situation is just one of many that this web site presents. Evidence of Orwell's prescience is that people do not think they live in that kind of world. The most effective propaganda and indoctrination system is one where its victims do not think they are being propagandized and indoctrinated. The United States has the most effective and subtle propaganda systems that the world has ever seen, by far.

Footnotes

[1] Professional chemists will be more precise and say that fluorine is the most "electronegative" element, meaning that it is the most aggressive electron "thief," because the alkali metals are the most "electropositive" elements, meaning their affinity to "give away" an electron, and electronegativity and electropositivity are not easy to compare, as far as "reactivity" goes. However, francium, probably the most electropositive element, is very rare, while fluorine is ubiquitous, and fluorine is far more "coercive," such as when it ended the "inert" status of the "noble" gases. So most "electronegative" is a more technically accurate term, while I consider most "reactive" the more practical term.

[2] See John Stauber and Sheldon Rampton, *Toxic Sludge is Good for You!*, pp. 209-212, for a copy of the public relations strategy of Clorox regarding bad environmental news regarding chlorine, and the book in general for how corporations wage war against environmental activists. See also David Helvag's *The War Against the Greens* for a broad overview of corporate efforts against environmentalists, including criminal acts.

[3] See Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, pp. 61-63.

[4] Roholm, Kaj. *Fluorine Intoxication*. London: H.K. Lewis & Co., 1937. pp. 64-65. Cited in Griffiths, "Fluoride: Commie Plot or Capitalistic Ploy." *Covert Action*, Fall 1992, p. 27.

[5] Ost, H. "The Fight Against Injurious Industrial Gases," *Z Agnew Chem*, Volume 20, 1907. pp. 1689-93, and Roholm, pp. 36-41. Cited in Griffiths, footnote cited above.

[6] Roholm, Kaj. "The Fog Disaster in the Meuse Valley: A Fluorine Intoxication," *Journal of Industrial Toxicology*, Vol. 19, 1937, pp. 126-137. Cited in Griffiths, footnote cited above.

[7] Lillie, Robert J. "Air Pollutants Affecting the Performance of Domestic Animals*," US Department of Agriculture Handbook No. 380*, August 1970, p.41 cited in Griffiths, footnote cited above. See also Gotzsche, *The Fluoride Question, Panacea or Poison?*, chapter 6.

[8] Reproduced in Yiamouyiannis, *Fluoride and the Aging Factor*, p. 99.

[9] Yiamouyiannis, *Fluoride and the Aging Factor*, p. 94.

[10] See Armstrong, W. D. and Singer, L. "Fluoride Contents of Enamel of Sound and Carious Human Teeth: A Reinvestigation." *J. Dent. Res*., 42:133-136, 1963. Cited in Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, p.84, n.24.

[11] See Christopher Bryson's *The Fluoride Deception*, chapter 14, pp. 176-183.

[12] See Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, pp. 61, 80-81.

[13] See Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, pp. 47-54.

[14] Gotzsche, Anne-Lise. *The Fluoride Question, Panacea or Poison?* p. 21.

[15] Sutton, P.R.N. *Fluoridation: Errors and Omissions in Experimental Trials*. Melbourne University Press, Melbourne Australia, 1959. Cited in Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, p. 205, n. 61. See also chapters 12, 17, 18, and 19 of Waldbott. See also Gotzsche, *The Fluoride Question, Panacea or Poison?*, pp. 61-65.

[16] See Christopher Bryson's *The Fluoride Deception*, p. 32.

[17] See John Stauber and Sheldon Rampton, *Toxic Sludge is Good for You!*, pp. 1, 22-32. See also Stewart Ewen's *PR!, A Social History of Spin*.

[18] See Christopher Bryson's *The Fluoride Deception*, chapter 17, pp. 217-229.

[19] Gotzsche, Anne-Lise. *The Fluoride Question, Panacea or Poison?* p. 31. Here is a relevant quote, "We have told the public that fluoridation works, so we can't go back on that." - F.A. Bull, at the 1951 Dental Health Conference in Washington, D.C.

[20] See discussion of The Inquisition's current state in chapter 7 of Baigent and Leigh, *The Dead Sea Scrolls Deception*.

[21] Hodge, Harold. "Research Needs in the Toxicology of Food Additives." *Food Cosmet. Toxicol.,* 1:25-31, 1963. Cited in Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, p.109, n.25.

[22] Waldbott, Burgstahler and McKinney. *Fluoridation, The Great Dilemma*. p. 55.

[23] Dalderup, L.M. "Nutrition and Caries." *World Rev Nutr. Diet*., 7:72-137, 1967. Cited in Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*. p. 55.

[24] Price, Weston. *Nutrition and Physical Degeneration*. See chapter 22, table 2, for a summary. See also Kennedy, *How to Save Your Teeth*, pp. 2-3.

[25] See Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, pp. 283-285.

[26] Radusch, D.F. "Variability of Diagnosis of Incidence of Dental Caries." Journal of the ADA, 28:1959-1961, 1941. Cf. Ennis Ler.R. "Oral Roentgenology and its Possibilities." *Journal of the ADA*., 21: 1367-1421, 1934. Cited in Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, p. 205, n. 59.

[27] See chapter 12 of Waldbott's *Fluoridation, The Great Dilemma*, for a sampling of the data not conforming to the rush to fluoridate.

[28] For dental decay, interesting data can be gleaned from Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, especially chapter 12. See also Whitaker, Julian. *Reversing Heart Disease.* pp. 60-62. See also Robbins, John. *Diet for a New America*. pp. 151-154.

[29] Aasenden, R. and Peebles, T.C. "Effects of Fluoride Supplementation from Birth on Human Deciduous and Permanent Teeth." *Arch. Oral. Biol*., 19: 321-326, 1974. Cited in Waldbott, Burgstahler and McKinney, *Fluoridation, The Great Dilemma*, p. 202, n.17.

[30] Jolly, S. S., et al. Endemic Fluorosis in Punjab II. *Dental Aspect, Fluoride*, 6:106-112, 1973. Cited in Waldbott, Burgstahler and McKinney. *Fluoridation, The Great Dilemma*, p. 202, n.18.

[31] See the conservative chapter 18 of Waldbott's *Fluoridation, The Great Dilemma*, or the highly charged chapters 17 to 19 in Yiamouyiannis' *Fluoride and the Aging Factor* for many examples of the kind of abuse of power this web site chronicles in many planes. Anne-Lise Gotzsche's *The Fluoride Question, Panacea or Poison?* is another good overview of how the establishment steamroller works. The people suppressing the findings of fluoride's harmfulness could go by the name "Fluoridation Mafia," similar to what Chernobyl scientist Chernousenko called the people who have been covering up radiation's harmful effects in general, and Chernobyl in particular, "The International Atomic Mafia."

[32] See Waldbott, Burgstahler and McKinney. *Fluoridation, The Great Dilemma*. pp. 324-332.

[33] U.S. Congressman, Dr. A. L. Miller, Chairman, Special Committee on Chemicals in Foods, "Fluoridation of Water, Extension of Remarks.,*Congressional Record*, March 25, 1952. pp. A1899-A1901. Cited in Yiamouyiannis, *Fluoride and the Aging Factor*, pp. 140-142.

[34] Research of George Glasser. Glasser's investigation and the ACLU's response, both occurring in January of 1997 have been posted on the Internet.

[35] In 1990 William Marcus, an EPA scientist, was fired for a memo he wrote which called for a review of a cover-up of toxicology studies that showed fluoride was a "probable human carcinogen." Marcus won a whistle-blower lawsuit and was reinstated at the EPA. In 1997 the Union of Government Scientists of the United States Environmental Protection Agency voted unanimously to sponsor a California initiative to ban fluoridation, citing eleven years of review of the medical evidence which indicates a "causal link" between fluoride and "cancer, genetic damage, neurological impairment and bone pathology." Taken from their statement of July 2, 1997.

[36] *New York Times*. January 20, 1979. Cited in Kennedy, *How to Save Your Teeth*, pp. 133-135.

[37] Church, L.E. "Fluorides - Use with Caution." *Journal of Maryland Dentistry, 1976*, cited in Hodge, "Fluoride Toxicology" in Newbrun, Ernest, ed.,*Fluorides and Caries Prevention*. pp. 203-204, 218, n. 9.

[38] See Duncan WK, Silberman SL, Trubman A - "Labial hypoplasia of primary canines in black Head Start children" ASDC J Dent Child 55(6):423-6 (1988). See Silberman SL, Duncan WK, Trubman A, Meydrech EF - "Primary canine hypoplasia in Head Start children" J Public Health Dent 49(1):15-8 (1989). See Li Y, Navia JM, Bian JY -"Caries experience in deciduous dentition of rural Chinese children 3-5 years old in relation to the presence or absence of enamel hypoplasia" Caries Res 30(1):8-15 (1996) Ellwood RP, O'Mullane D - "The association between developmental enamel defects and caries in populations with and without fluoride in their drinking water" J Public Health Dent 56(2):76-80(1996). Cited in "Fluoride - What's Wrong With This Picture?" Andreas Schuld, posted to the Internet in 2000.

[39] Hydrofluoric acid eats glass containers, so it is usually stored in containers without glass. I remember seeing a bottle of hydrofluoric acid in my first chemistry lab. The bottle was corroded and looked dangerous to touch. It is highly dangerous to handle, eating the flesh it touches with gusto. What makes hydrofluoric acid doubly dangerous is that as it eats flesh it also produces anesthetic effects (those nervous system effects are discussed later in this essay), which deadens the pain as it eats the flesh, so people do not notice the damage done until too late. People can die from a mere whiff of hydrogen fluoride. In my years in chemistry labs I used hydrochloric, sulfuric, nitric, phosphoric and other acids, but I never, ever saw hydrofluoric acid used, even as a demonstration. It was simply too dangerous. If a

fluorine truck wrecks and spills its contents, throwing water on it is useless, because the fluorine gas will actually *burn* the water.

[40] See Christopher Bryson's *The Fluoride Deception*, pp. 69-77.

[41] Regarding this matter, see the recently published *Undue Risk* by Jonathan Moreno, which documents the undeniable human experiments that the United States performed on often unwitting and unwilling people. Although Moreno is takes it far too easy on our government's crimes, it is a good introduction. A better effort is Andrew Goliszek's chilling *In the Name of Science*, published in 2003.

[42] Klass, Philip. "The 'Top Secret UFO Papers' NSA Won't Release." *The Skeptical Inquirer*. Fall, 1989, pp. 65-68.

[43] It used to be posted on the Guerilla News Network, but is not there anymore. Interviews with Phillips can be found elsewhere on the Internet, and that theme can be found.

[44] See also Christopher Bryson's *The Fluoride Deception*, p. 50.

[45] See Christopher Bryson's *The Fluoride Deception*, chapter 9, pp. 78-90.

[46] That document can be seen in Christopher Bryson's *The Fluoride Deception*, in the pictures section. It can also be found on the Internet.

[47] High aluminum concentrations have been found in the brains of Alzheimer's victims, and the appearance of Alzheimer's has coincided with the introduction of aluminum cookware. Also, "In January 1987, experiments performed at the Medical Research Endocrinology Dept., Newcastle upon Tyne, England, and the Physics Dept of the Univ. of Ruhana, Sri Lanka, showed that fluoridated water at 1 PPM, when used in cooking in aluminum cookware, concentrated the aluminum up to 600 PPM, whereas water without fluoride did not." (*Science News* (131:73)). That research was also confirmed in America when the research results in England and Sri Lanka were investigated. A test was performed on Antigo Wisconsin water. Antigo had been fluoridated for 33 years. The water was examined by a certified Wisconsin laboratory, and showed that when used in cooking with aluminum cookware, it concentrated the aluminum by 833 times, and increased the fluoride content by 100%. That made that water's aluminum content 75 times higher than the maximum allowed by the WHO. That information is taken from a paper by Isabel Jansen, R.N. (Journal of the National Academy of Research Biochemists - Jan/Feb '90). To pursue the Alzheimer's-aluminum connection further, one place to start is the letter and references of Dr. William Grant's letter to the *Townsend Letter for Doctors and Patients*, p. 92, in the June 1999 issue.

[48] For instance, during the Un-American hearings during the McCarthy days, USAF Major George R. Jordan testified to his duties of securing vast quantities of sodium fluoride and shipping it to Siberia during World War II. The Russian fluoride recipients openly told Jordan that they were "... using the fluoride in the water supplies in their concentration camps, to make the prisoners stupid, docile, and subservient."

[49] Cited in Mullins, Eustace, *Murder by Injection*, pp. 353-354.

[50] This quote is from Section VII of the EPA Chemical Profile on Sarin of October 31, 1987, regarding the neutralization of Sarin: "Rapidly hydrolyzed by dilute aqueous sodium hydroxide or sodium carbonate forming relatively non-toxic products. Water alone removes the fluorine atom, producing a non-toxic acid (Merck 1983, p. 1204)"

[51] Studies cited in *San Diego Business Wire*, Nov. 29, 1996. Cited by Citizens for Safe Drinking Water, at AOLNewsProfiles@aol.net. Several Chinese studies have reported from places of naturally high fluoride concentration, and in coal mining areas. The news is not good. The Leading Edge Research Group has published those paper abstracts on the Internet.

[52] Gatto, John. *Dumbing us Down*. p. 26.

[53] Recently declassified documents have shed much light on other World War II-era events, such as hiring the Nazis to staff the CIA's intelligence network in Europe, which took humanity to the brink of World War III, as the Nazis lied to America about Soviet military capability and intentions. There are cases of Nazi doctors performing human experiments in the death camps, and going on the U.S. payroll weeks later. Regarding the atomic bomb, it is now clear that dropping the bombs on Japan had little or nothing to do with saving American lives. For a hint of what it was like to be a Japanese school child, playing near Ground Zero in Hiroshima while that lone plane flew overhead, read *Day One* by Peter Wyden. Microsoft's *Encarta* encyclopedia presents the audio clip of the announcement Truman made after we dropped the bomb on Hiroshima. He lied to the American people by calling Hiroshima a "military base." That is similar to calling Salt Lake City a military base. At Ground Zero was a hospital, two hundred yards away from an elementary school.

[54] See Christopher Bryson's *The Fluoride Deception*, p 28.

[55] Mullenix's experiences with Hodge, the NIH, and her reactions to the newly declassified documents were originally published in Griffiths and Bryson, "Fluoride, Teeth and the Atom Bomb", July 1997. The *Christian Science Monitor* commissioned the article, but did not publish it. It is published on the Internet, as well as other articles regarding Mullenix's findings and advocacy work she was doing. For those interested in more depth on the Mullenix/Hodge issue, I can recommend no recent work more highly than Christopher Bryson's masterpiece, *The Fluoride Deception*, published in 2004. It was the book I had been waiting for since 1998.

[56] Those Mullenix quotes are from The Winds' web site, which conducted an interview of her while researching their article.

[57] Those Mullenix quotes are from The Winds' web site.

[58] Dr. Robert Isaacson of Binghamton University, New York conducted two studies using low levels of aluminum fluoride and sodium fluoride. The results were published in 1992 and 1994, predating Mullenix's publication, and the results were similar. Isaacson's study was spurred by data that showed Alzheimer's disease having a higher incidence in fluoridated areas.

[59] See Christopher Bryson's *The Fluoride Deception*, p. 62.

[60] Newbrun, Ernest, ed. *Fluorides and Caries Prevention*. p. 212.

[61] Newbrun, Ernest, ed. *Fluorides and Caries Prevention*. p. 206.

[62] See Christopher Bryson's "The Donora Fluoride Fog: A Secret History of America's Worst Air Pollution Disaster" in the fall 1998 issue of *Earth Island Journal*. He also devoted chapter 9 of *The Fluoride Deception* to that event.

[63] See the excellent investigative report on that situation regarding tetraethyl lead in Jamie Lincoln Kitman's special report to *The Nation*, titled "The Secret History of Lead," in its March 20, 2000 issue.

[64] See Christopher Bryson's *The Fluoride Deception*, pp. 105-113.

[65] See Christopher Bryson's *The Fluoride Deception*, chapter 15, pp. 184-201.

[66] See John Stauber and Sheldon Rampton's *Toxic Sludge is Good for You!* In that book is the incredible story of how a woman tried getting the authors to change the name of the book from "toxic sludge" to something such as "cigarettes." Why? It turned out that the woman was a PR flack for…toxic sludge! In American sewage treatment, the planners short-sightedly commingled human with industrial sewage. Human waste is recyclable, industrial waste is not, at least not for fertilizing one's garden. When the two are mixed, it is truly a toxic sludge, not fit for much except being buried along with thenuclear waste. The sewage managers, though, have sought to turn the toxic sludge into fertilizer, to be used on gardens and farms. There are municipal sewage districts that sell their sewer sludge today for that purpose. It is full of deadly industrial toxins, though. Truth is stranger than fiction, and the authors could hardly believe it when the PR flack tried getting them to rename their book, because it might create a bad name for…toxic sludge!

[67] Gotzsche, Anne-Lise. *The Fluoride Question, Panacea or Poison?* p. 79-80, 96, 168. Incredibly, such an irresponsible idea that fluoride is an essential nutrient is alive and well today, with the National Academy of Sciences publishing a report in 1997 titled "Dietary Reference Intakes" that lists fluoride right up there with calcium and Vitamin D. Many responsible scientists have protested it.

[68] See Gotzsche, Anne-Lise, *The Fluoride Question, Panacea or Poison?*, p. 8. In a 1972 report by the ADA, it is stated that dentists make 17% more profit in fluoridated areas as opposed to non-fluoridated areas (Douglas et al., "Impact of water fluoridation on dental practices and dental manpower",*Journal of the American Dental Association*; 84:355-67, 1972).

Fluoridation: A Chemistry Prelude, Now an Addendum

The next few pages will present a brief chemistry narrative on fluorine, and why it is such an important industrial chemical. Chemistry is one of the most empirical sciences. Much of chemistry is not theoretical, but the empirical result of what happens to substances under certain conditions. Chemicals are put together, and chemists see what happens. Those observations over the years, summarized within the profession, make up a great deal of chemistry textbooks. Chemists measure how much energy is given off or absorbed by reactions, what the byproducts are, and so forth.

Many theories have been developed to account for experimental results, and many have stood the test of time, while others have fallen by the wayside. That is the normal progress of any science, but chemistry has more empiricism and less theory than almost any other "hard" science, and is one of the more nascent. We have many

theories, and they are useful, until a new discovery happens. Einstein said that every theory is eventually killed by a fact.

Chemistry is generally concerned with the ways that elements combine. An aspect of chemistry called nuclear chemistry is new to the twentieth century. Most chemistry, however, is not concerned with an atom's nucleus, but with its electrons.

In “classic” chemistry, an atom's basic components are the nucleus and the electrons orbiting it. The nucleus is composed of two primary “particles”: protons and neutrons. In classical chemistry, a neutron is considered pure mass, and has no net electrical charge, which is why it is called a neutron, meaning neutral. It is now known that the neutron is further divisible, composed of other “particles.” That begins venturing into nuclear chemistry, which is not this essay's concern.

As of 2002, science had discovered 114 elements. A little more than ninety are naturally occurring, and scientists have artificially created the rest. All artificial elements are unstable, and thus are called radioactive, as they give off energy and particles when they decay into simpler, more stable elements. Hydrogen has one proton in its nucleus, while oxygen has eight, gold has seventy-nine, and so on. Each element has a unique number of protons. All of the elements have neutrons in their nuclei, except the most common form of hydrogen. The neutron adds to an atom's mass, but has no net electrical charge.

Orbiting the nucleus are electrons. Electrons, according to current theory, have little mass but an electric charge equal to a proton, but the opposite (I have seen at least one theory that argues that electrons have no mass, but that is not generally accepted today). In a "normal" atom, the protons' positive charges and electrons' negative charges balance each other, and the atom's net electrical charge is zero.

Electrons orbit the nucleus in strange ways. The science of electrons and how they orbit is perhaps the weirdest mainstream science, called quantum mechanics. Electrons do not orbit the nucleus as the earth orbits the sun, in an orderly ellipse - they jump all around, appearing and disappearing. Because atoms are so tiny, and electrons move at a significant fraction of light speed, observing exactly what electrons do is currently impossible, and quantum physics is one of the oddest and most difficult studies in science. Richard Feynman said that *nobody* really understood quantum theory. Einstein took great exception to some of quantum theory's cornerstones, and many observers believe that quantum theory will be radically altered when more is known. However, quantum theory has spawned rules and equations that agree well with what science has observed so far.

Electrons orbit the nucleus in “shells.” Each shell has distinct properties. The shells are the same for every element. As an atom gets larger, the shells closest to the nucleus are filled first, the more distant ones filled later. The shells have been calculated to contain 2, 8, 18, 32, 50,72 and 98 electrons, respectively, the last shells being more theoretical than actual, as those shells could accommodate 280 electrons, but the

largest element yet observed is element 116 (even though its life is measured in milliseconds, before it decays into simpler elements). There are also subshells within electron shells, which form further patterns in how shells are filled. Hydrogen, the simplest element, has one electron. That electron inhabits the first shell, so that shell is "half full." Helium has two electrons, filling the first shell. Oxygen has eight electrons, which fill the first shell and six of eight positions in the second shell. So goes the periodic table, each element having one more proton and electron than the previous one, each successive electron shell getting filled. It is also slightly more complicated. As the third shell gets filled, the first eight electrons fill the third, then the next go to the fourth shell, then the third and fourth shells are filled together. For instance, potassium has 19 electrons, the 19^{th} residing as the first electron in the fourth shell, but the third is not yet filled (the first shell has 2, electrons, 8 in the second, and only 8 in the third, not the 18 it takes to fill it, so the electron layout for potassium is: 2 + 8 + 8 + 1 = 19). As the shells are filled, eight and eighteen become breaking points to begin filling subsequent shells. It is an orderly progression.

Those shells, and how full or empty they are, represent the essence of chemistry. An atom with a shell mostly filled "wants" another electron to help fill its shell. An atom with a shell mostly empty will give away those electrons in its outer shell easily. Oxygen, for instance, "wants" two more electrons to fill its shell. Sodium, element number 11, with one electron in its third shell (2 + 8 + 1 = 11), readily "gives away" that outermost electron. The closer an atom is to having its shells filled or empty, the more reactive it is. The periodic table of elements is designed along the electron shell layout. Elements with the same number of open positions in its shell, or excess electrons, behave similarly. Lithium, sodium, potassium and a few other elements have one "extra" electron, and belong to the "family" known as alkali metals. They are highly reactive, and react violently when put into water, forming caustic solutions. Sodium and water produces what is commonly called lye.

The elements having their electron shells perfectly filled, meaning 2, 10, 18, 36, 54 and 86 electrons, are in a family. Those elements "like" having their number of electrons, and do not want any more, nor do they want to give any away. Those elements are all gases. They are called "noble" gases. Those gases are helium, neon, argon, krypton, xenon and radon. Chemists thought for a long time that nothing would react with them, and they were called "inert." To "react" means to either give electrons to, or take them from, other atoms. It also means sharing electrons, forming a "bond" between the atoms.

There is another prominent family of elements: those that need but one electron to fill their shells. Hydrogen is the only element that belongs in two families. Because hydrogen has one electron in a two-electron shell, it is either half empty or half full, depending on what it reacts with. Hydrogen can either take an electron or give one away. Hydrogen is therefore in the family that wants one more electron, and it also belongs to the alkali metal family, eager to give away one electron. The other elements that want one more electron are fluorine, chlorine, bromine, iodine, and astatine. The family goes by the name "halogen," which means "salt formers."

In this short chemistry narrative, it may become obvious that the ideal match is putting an alkali metal with a halogen, as one wants to give away an electron, and the other wants to take one. That is precisely the most reactive situation that chemists know of. If potassium were put into fluorine gas, the reaction would happen so fast it would be explosive. Halogens and alkali metals are the most reactive elemental families. Fluorine is the most reactive element known to science (although that can be disputed by chemists, who prefer saying that fluorine is the most “electronegative.” See footnote 1.). The "inert" gases proved less inert than chemists originally thought. In 1962, chemists were able to combine xenon with fluorine, forming xenon tetrafluoride, made of one xenon and four fluorine atoms. Many “inert” gas compounds were subsequently made, and were usually unstable compounds. Chemists stopped calling those gases inert, and the term “noble” came into use.

The most abundant wedding of alkali metals and halogens on earth is sodium chloride, more commonly called salt. With salt, as with the other alkali/halogen compounds, the electron is barely shared between the atoms; it is nearly seized from the metal by the halogen. Thus the chlorine atom has an extra electron, and the sodium atom has one less. The chlorine atom then takes on a net negative electrical charge, and the sodium atom a positive one. Those charged atoms easily become “ions.” An ion is a free atom or molecule with a net electric charge. If salt is put into water, it dissolves, where the electron is cleanly taken from the sodium atom by the chlorine atom, and both atoms become ions, forming an “ionic” solution. Because of the electrically charged ions, salt water is a fairly reactive solution, which is why cars parked next to the ocean rust as they do.

Most reactions between the elements are not as “perfect” as salt is. Usually the elements share electrons. Water is a standard case of that electron sharing. An oxygen atom wants two electrons, and hydrogen will give its electron away under the right conditions. Hydrogen and oxygen will form water, or H_2O. The oxygen atom does not seize the hydrogen’s electrons; instead, they are shared. If a water molecule could be seen, it would look similar to Mickey Mouse’s head, where the ears are hydrogen atoms and the oxygen atom is Mickey’s skull. Although the hydrogen atoms are not ionized, the oxygen hogs the electrons. In a water molecule, the oxygen atom takes on a negative charge, while the hydrogen atoms gain a positive charge. Because of that atomic relationship, water is known as a polarized molecule, with electrical poles. Water is an unusual compound because of that polarity.

Because of that polarity, water molecules attract each other more than similar compounds. Water has a boiling point far higher than its constituent elements oxygen or hydrogen have, and water’s boiling point is also higher than methyl and ethyl alcohol, both of which have larger and heavier molecules. That is because the alcohol molecules are not as polarized. In water, the positively charged hydrogen atoms are attracted to the negatively charged oxygen atoms of neighboring molecules, forming a weak bond. That bond is known as a hydrogen bond. Hydrogen bonding makes water the unusual and miraculous substance that it is.

Every element and compound has “states.” Every substance has its solid, liquid or gaseous “state.” Oxygen is found as O_2 in nature. Atmospheric hydrogen and nitrogen are also found in their “diatomic” state. Oxygen melts at about -360° F and boils at about -300° F. The melting and boiling points of elements and compounds relate to the substance's “weight." In chemistry, the weights are called atomic and molecular weights. Electron shells determine an element's chemical properties, and make at atom such as lithium, with an atomic weight of 7, a metal at room temperature, while radon, with an atomic weight of 222, is a gas. Yet, similar families and elements have boiling point differences largely determined by their molecular weights. Within the elemental families and molecular families, such as alcohols, the greater the molecular weight, the higher the melting and boiling point.

A molecule of water has a molecular weight of 18, oxygen weighing 16 (8 protons and 8 neutrons), and the hydrogen 2 (two atoms of one proton each). Atmospheric oxygen, O_2, has a molecular weight of 32. We see that oxygen boils at -300° F, but the much lighter water boils at 212° F, at sea level. The reason for that huge difference is that water molecules have much more attraction to each other than oxygen molecules do, because of that hydrogen bonding. Ammonia is another compound with relatively high polarity because of hydrogen bonding. Ammonia is composed of one nitrogen atom (the element next to oxygen on the periodic table, which needs three electrons to complete its shell) and three hydrogen atoms. Ammonia has a molecular weight of 17, less than water. The ammonia molecule's boiling point is -28° F, far higher than atmospheric nitrogen, with a molecular weight of 28, which boils at -320° F.

Adding enough heat energy so the molecules vibrate enough to overcome their mutual attraction produces melting and boiling. If the molecules are highly attracted to each other, their boiling point is high. If the molecules are not attracted to each other, their boiling point is low.

Because of ammonia’s low boiling point relative to the environment, and its high latent heat of vaporization, ammonia is the ideal refrigerant…well, not completely ideal. Ammonia is highly poisonous. Early refrigerators used ammonia as the refrigerant, but if the refrigeration lines sprang a leak at night, the entire family could die in their beds.

Early in the 20th century, an old money empire that supplied virtually all American gunpowder and explosives, almost since the nation was founded, arming America for all of its wars, got into the fast-rising chemicals industry. Du Pont Corporation developed alternatives to ammonia as a refrigerant. The refrigerants went by the trade name Freon, and the most popular, R-12, was made of one carbon atom bonded to two chlorine and two fluorine atoms. Carbon has its eight-electron shell half full, so carbon ideally makes four bonds to other elements. Carbon makes complicated bonds with other atoms. There is an entire branch of chemistry solely devoted to carbon. It is called organic chemistry, because carbon is the basis for life on earth.

R-12 has a boiling point of -22° F, low for a molecular weight of 121. Diatomic chlorine has a molecular weight of 71, but a boiling point of -30° F. The reason for Freon's low

boiling point is the molecule's symmetry in shape as well as electric charge. The molecule is not polarized, the inter-molecular attraction is minimal, and therefore relatively less vibration needs to be introduced to cause the molecules to separate.

The other attraction of R-12 and the other Freons was their relative inertness, which ventures into chlorine and fluorine's great reactivity. Chlorine or fluorine gas never float around in the atmosphere. They are so highly reactive, because of that unfilled electron shell, that they react to almost anything they touch, in search of that electron to fill their shells. Once they get that electron, they never let go, unless a chemist subjects them to tremendous energies not found in nature. Most halogens have bonded to metals in the environment, which is where they are found. Sea salt is the classic example of a halogen bonding with a metal, particularly an alkali metal, eager to give up its spare electron. In those halide salts, the compounds are highly polarized because of the highly unequal electron sharing. When such a salt is put into water, the highly polarized water reacts with the highly polarized salt, and the salt dissolves, creating salt ions in the water.

Carbon is not much of an ionizing element, as it would want to give up half its electron shell to ionize, or take on four more electrons. Carbon usually makes bonds where the electrons are shared, called a covalent bond. The electron bonds in Freon are stable: no atom wants to change the arrangement and react with something else. Because of that inert, stable nature, Freon is generally considered safe for human contact. It will not react with human flesh much, and even when inhaled produces little effect, although some of the less stable Freons can produce anesthetic and psychoactive effects, and can be corrosive.

Those tight bonds and molecular symmetry make Freon useful. Teflon is another fluorocarbon. The stability and "safety" of fluorocarbons ironically are potentially a threat to life on earth. There is theory and evidence that the heavy Freon molecule can float up to the atmosphere's ozone layer, where the sun's radiation destroys the molecule. The resulting chlorine ions (the fluorine ions do also, although they do not get as much press and are less damaging than chlorine) catalyze the ozone, which is O_3, back to O_2, destroying the ozone layer, which shields the earth's surface from ultraviolet solar radiation. That is what made the Freon/ozone controversy, which continues today. There are other theories regarding the observed ozone depletion, but the artificial chloro-fluorocarbon issue (of which Freon is only one of many chemicals) has significant evidence in its favor. Even if it is not the entire reason for ozone layer depletion, it is difficult to argue to continue using it.

There are existing conspiracy theories that Freon was banned to make way for more expensive refrigerants, making even more money for chemical companies, which is the case today. That theory may be wrong, but is worth pondering. Many natural substances can be used as refrigerants, such as water and carbon dioxide, but chemical companies would not make much money off them, as was the case when lead replaced alcohol to boost gasoline's octane rating. The issue's capitalistic (greed) component could be major.

Fluorine is among the Industrial Revolution's most important chemicals. Aluminum is the most abundant metal in the earth's crust, making up about 8% of it. Iron is second at 5%. Oxygen and silicon are the most abundant crust elements, comprising 47% and 28% respectively. Aluminum was not used in civilization until the late 19th century, because it was difficult to effectively extract and refine. Even today, most aluminum is not commercially obtainable because it is usually bound up in silicon compounds called silicates. Bauxite, a class of aluminum oxides, is the primary source of aluminum ore. It was not until 1886 that a method was discovered to economically refine aluminum. The process was to dissolve bauxite in cryolite, a ten-atom molecule composed of one aluminum, three sodium, and six fluorine atoms. The mix was then charged with electricity in an electrolysis process, which separated the aluminum. That process is still the main one used today. The process needs electricity, cryolite, and bauxite. When the aluminum is removed, sodium fluoride is the main byproduct, and it is a deadly poison.

This site's main fluoridation narrative deals with fluoride waste and the real world. It is a terrifying tale of power and greed that continues today, with hundred of millions of victims, including most of the people reading this.

Material Safety Data Sheet
Fluorosilicic Acid

ACC# 11110

Section 1 - Chemical Product and Company Identification

MSDS Name: Fluorosilicic Acid
Catalog Numbers: A1481LB
Synonyms: Hydrofluosilicic Acid; Hydrogen Hexafluorosilicate; Hydrosilicofluoric Acid.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	74-76%	231-791-2
16961-83-4	FLUOROSILICIC ACID	24-35%	241-034-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid.
Danger! Corrosive. Causes eye and skin burns. Long-term exposure may cause bone and joint changes. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.
Target Organs: Skeletal structures, bone.

Potential Health Effects

Eye: Causes eye burns. May cause chemical conjunctivitis and corneal damage.
Skin: Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.
Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Ingestion of large amounts of fluoride may cause salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Inorganic fluorides can be harmful. Acute exposure to fluorine compounds can lead to digestive tract burns, and abdominal pain. Exposure to fluoride compounds can result in systemic toxic effects on the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. Contains fluoride. Fluoride can reduce calcium levels leading to fatal hypocalcemia. May cause systemic effects. Ingestion may cause intense thirst, shock, convulsions, and possible death.

Acute exposure to fluoride compounds may cause severe systemic toxicity including heart, liver, and kidney abnormalities.
Inhalation: Causes chemical burns to the respiratory tract. The toxicological properties of this substance have not been fully investigated. Aspiration may lead to pulmonary edema. May cause systemic effects.
Chronic: Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Effects may be delayed. Chronic exposure to fluoride compounds may cause systemic toxicity.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).
Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Do not get on skin or in eyes. Avoid ingestion and inhalation. Do not ingest or inhale. Use with adequate ventilation. Discard contaminated shoes.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Avoid storage in glass containers.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
FLUOROSILICIC ACID	none listed	none listed	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. FLUOROSILICIC ACID: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: colorless
Odor: acrid odor - pungent odor
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: 4.97
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density:1.2740g/cm3
Molecular Formula:H2F6Si
Molecular Weight:144.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, glass.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen fluoride gas, silicon dioxide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 7732-18-5: ZC0110000
CAS# 16961-83-4: VV8225000
LD50/LC50:
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;
.

CAS# 16961-83-4:
Oral, rat: LD50 = 430 mg/kg;
.

Carcinogenicity:
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 16961-83-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLUOROSILICIC ACID	FLUOROSILICIC ACID
Hazard Class:	8	8
UN Number:	UN1778	UN1778
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.
CAS# 16961-83-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 16961-83-4: immediate, delayed, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 16961-83-4 can be found on the following state right to know lists: New Jersey, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:
C
Risk Phrases:
R 34 Causes burns.

Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 27 Take off immediately all contaminated clothing.
S 37 Wear suitable gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 28A After contact with skin, wash immediately with plenty of water .

WGK (Water Danger/Protection)
CAS# 7732-18-5: No information available.
CAS# 16961-83-4: 2
Canada - DSL/NDSL
CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 16961-83-4 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of E, F.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 16961-83-4 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997
Revision #5 Date: 9/26/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

John D.B. Featherstone, MSc, PhD

Dean, School of Dentistry

John Featherstone, MSc, PhD, is Professor of Preventive and Restorative Dental Sciences at the University of California, San Francisco (UCSF) and Dean of the School of Dentistry. He earned his MSc in physical chemistry from the University of Manchester (UK) and a PhD in chemistry from the University of Wellington (New Zealand).

His research over the past 34 years has covered several aspects of cariology (study of tooth decay) including fluoride mechanisms of action, caries risk assessment, de- and remineralization of the teeth, apatite chemistry, salivary dysfunction, caries (tooth decay) prevention, and laser effects on dental hard tissues with emphasis on caries prevention and early caries removal. He is currently active in implementing caries management by risk assessment in several dental schools across the nation.

He has won numerous national and international awards, including the International Association for Dental Research distinguished scientist award for research in dental caries (2000), the Zsolnai Prize from the European Caries Research Organization (2002) for his lifelong contributions to caries research, the “Ericsson Prize in Preventive Dentistry” by the Swedish Patent Fund (2002) and the Norton Ross Award for excellence in clinical research from the American Dental Association (2007).

He has published over 200 manuscripts and book chapters. He is the principal investigator on one National Institutes of Health RO1 grant and co-investigator on five other NIH grants.

Study By John D. B. Featherstone
Community Dentistry and Oral Epidemiology

Volume 27, **Issue 1**, **pages 31–40**, **February 1999**

“The level of fluoride incorporated into dental mineral by systemic ingestion is insufficient to play a significant role in caries prevention. The effect of systemically ingested fluoride on caries is minimal.”

Excerpts from the Scientific Literature - Topical Vs. Systemic:

"Fluoride is most effective when used topically, after the teeth have erupted."
SOURCE: Cheng KK, et al. (2007). Adding fluoride to water supplies. British Medical Journal 335(7622):699-702.

"it is now accepted that systemic fluoride plays a limited role in caries prevention."
SOURCE: Pizzo G, Piscopo MR, Pizzo I, Giuliana G. (2007). Community water fluoridation and caries prevention: a critical review. Clinical Oral Investigations 11(3):189-93.

“the major anticaries benefit of fluoride is topical and not systemic.”
SOURCE: National Research Council. (2006). Fluoride in Drinking Water: A Scientific Review of EPA's Standards. National Academies Press, Washington D.C. p 13.

"Since the current scientific thought is that the cariostatic activity of fluoride is mainly due to its topical effects, the need to provide systemic fluoride supplementation for caries prevention is questionable."
SOURCE: European Commission. (2005). *The Safety of Fluorine Compounds in Oral Hygiene Products for Children Under the Age of 6 Years*. European Commission, Health & Consumer Protection Directorate-General, Scientific Committee on Consumer Products, September 20.

“The results of more recent epidemiological and laboratory studies can be summarized by stating that posteruptive (topical) application of fluoride plays the dominant role in caries prevention."
SOURCE: Hellwig E, Lennon AM. (2004). Systemic versus topical fluoride. *Caries Research* 38: 258-62.

"When it was thought that fluoride had to be present during tooth mineralisation to 'improve' the biological apatite and the 'caries resistance' of the teeth, systemic fluoride administration was necessary for maximum benefit. Caries reduction therefore had to be balanced against increasing dental fluorosis. The 'caries resistance' concept was shown to be erroneous 25 years ago, but the new paradigm is not yet fully adopted in public health dentistry, so we still await real breakthroughs in more effective use of fluorides for caries prevention."
SOURCE: Fejerskov O. (2004). Changing paradigms in concepts on dental caries: consequences for oral health care. *Caries Research* 38: 182-91.

“Current evidence strongly suggests that fluorides work primarily by topical means through direct action on the teeth and dental plaque. Thus ingestion of fluoride is not essential for caries prevention."

SOURCE: Warren JJ, Levy SM. (2003). Current and future role of fluoride in nutrition. *Dental Clinics of North America* 47: 225-43.

"[T]he majority of benefit from fluoride is now believed to be from its topical, rather than systemic, effects."
SOURCE: Brothwell D, Limeback H. (2003). Breastfeeding is protective against dental fluorosis in a nonfluoridated rural area of Ontario, Canada. *Journal of Human Lactation* 19: 386-90.

"For a long time, the systemic effect of fluoride was regarded to be most important, resulting in recommendations to use fluoride supplements such as tablets or drops. However, there is increasing evidence that the local effect of fluoride at the surface of the erupted teeth is by far more important."
SOURCE: Zimmer S, et al. (2003). Recommendations for the Use of Fluoride in Caries Prevention. *Oral Health & Preventive Dentistry* 1: 45-51.

"By 1981, it was therefore possible to propose a paradigm shift concerning the cariostatic mechanisms of fluorides in which it was argued that the predominant, if not the entire, explanation for how fluoride controls caries lesion development lies in its topical effect on de- and remineralization processes taking place at the interface between the tooth surface and the oral fluids. This concept has gained wide acceptance... With today's knowledge about the mechanisms of fluoride action, it is important to appreciate that, as fluoride exerts its predominant effect... at the tooth/oral fluid interface, it is possible for maximum caries protection to be obtained without the ingestion of fluorides to any significant extent."
SOURCE: Aoba T, Fejerskov O. (2002). *Critical Review of Oral Biology and Medicine* 13: 155-70.

"[F]luoride's predominant effect is posteruptive and topical."
SOURCE*:* Centers for Disease Control and Prevention. (2001). Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. *Morbidity and Mortality Weekly Report* 50(RR14): 1-42.

"The prevalence of dental caries in a population is not inversely related to the concentration of fluoride in enamel, and a higher concentration of enamel fluoride is not necessarily more efficacious in preventing dental caries."
SOURCE: Centers for Disease Control and Prevention. (2001). Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. *Morbidity and Mortality Weekly Report* 50(RR14): 1-42.

"Fluoride incorporated during tooth development is insufficient to play a significant role in caries protection."
SOURCE: Featherstone, JDB. (2000). The Science and Practice of Caries Prevention. *Journal of the American Dental Association* 131: 887-899.

"Current evidence suggests that the predominant beneficial effects of fluoride occur locally at the tooth surface, and that systemic (preeruptive) effects are of much less importance."
SOURCE: Formon, SJ; Ekstrand, J; Ziegler, E. (2000). Fluoride Intake and Prevalence of Dental Fluorosis: Trends in Fluoride Intake with Special Attention to Infants. *Journal of Public Health Dentistry* 60: 131-9.

"Fluoride supplementation regimens suffer from several shortcomings, the first of which may be their derivation from a time when the major effect of fluoride was thought to be systemic. Although evidence that fluoride exerts its effects mainly through topical contact is great, supplementation schemes still focus on the ingestion of fluoride."
SOURCE: Adair SM. (1999). Overview of the history and current status of fluoride supplementation schedules. *Journal of Public Health Dentistry* 1999 59:252-8.

"The case is essentially a risk-benefit issue - fluoride has little preeruptive impact on caries prevention, but presents a clear risk of fluorosis."
SOURCE: Burt BA. (1999). The case for eliminating the use of dietary fluoride supplements for young children. *Journal of Public Health Dentistry* 59: 260-274.

"Until recently the major caries-inhibitory effect of fluoride was thought to be due to its incorporation in tooth mineral during the development of the tooth prior to eruption...There is now overwhelming evidence that the primary caries-preventive mechanisms of action of fluoride are post-eruptive through 'topical' effects for both children and adults."
SOURCE: Featherstone JDB. (1999) Prevention and Reversal of Dental Caries: Role of Low Level Fluoride. *Community Dentistry & Oral Epidemiology* 27: 31-40.

"[L]aboratory and epidemiologic research suggests that fluoride prevents dental caries predominately after eruption of the tooth into the mouth, and its actions primarily are topical for both adults and children."
SOURCE: Centers for Disease Control and Prevention. (1999). Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries. *Morbidity and Mortality Weekly Report* 48: 933-940.

"[R]esearchers are discovering that the topical effects of fluoride are likely to mask any benefits that ingesting fluoride might have... This has obvious implications for the use of systemic fluorides to prevent dental caries."
SOURCE: Limeback, H. (1999). A re-examination of the pre-eruptive and post-eruptive mechanism of the anti-caries effects of fluoride: is there any caries benefit from swallowing fluoride? *Community Dentistry and Oral Epidemiology* 27: 62-71.

"Although it was initially thought that the main mode of action of fluoride was through its incorporation into enamel, thereby reducing the solubility of the enamel, this pre-eruptive effect is likely to be minor. The evidence for a post-eruptive effect, particularly its role in inhibiting demineralization and promoting remineralization, is much stronger."
SOURCE: Locker D. (1999). Benefits and Risks of Water Fluoridation. An Update of the

1996 Federal-Provincial Sub-committee Report. Prepared for *Ontario Ministry of Health and Long Term Care.*

"Recent research on the mechanism of action of fluoride in reducing the prevalence of dental caries (tooth decay) in humans shows that fluoride acts topically (at the surface of the teeth) and that there is neglible benefit in ingesting it."
SOURCE: Diesendorf, M. et al. (1997). New Evidence on Fluoridation. *Australian and New Zealand Journal of Public Health*21 : 187-190.

"On the basis of the belief that an adequate intake of fluoride in early life is protective against caries in later life, fluoride supplements are recommended for infants and children living in areas in which the fluoride content of the drinking water is low. However, critical reviews of the evidence have led to the conclusion that the effect of fluoride in decreasing the prevalence and severity of dental caries is not primarily systemic but exerted locally within the oral cavity. Because fluoride supplements are quickly cleared from the mouth, the possibility must be considered that they may contribute to enamel fluorosis, which is unquestionably a systemic effect, while providing relatively little protection against dental caries."
SOURCE: Ekstrand J, et al. (1994). Fluoride pharmacokinetics in infancy. *Pediatric Research* 35:157–163.

"It is now well-accepted that the primary anti-caries activity of fluoride is via topical action."
SOURCE: Zero DT, et al. (1992). Fluoride concentrations in plaque, whole saliva, and ductal saliva after application of home-use topical fluorides. *Journal of Dental Research* 71:1768-1775.

"I have argued in this paper that desirable effects of systemically administered fluoride are quire minimal or perhaps even absent altogether."
SOURCE: Leverett DH. (1991). Appropriate uses of systemic fluoride: considerations for the '90s. *Journal of Public Health Dentistry* 51: 42-7.

"It, therefore, becomes evident that a shift in thinking has taken place in terms of the mode of action of fluorides. Greater emphasis is now placed on topical rather than on systemic mechanisms..."
SOURCE: Wefel JS. (1990). Effects of fluoride on caries development and progression using intra-oral models. *Journal of Dental Research* 69(Spec No):626-33;

"[E]vidence has continued to accumulate to support the hypothesis that the anti-caries mechanism of fluoride is mainly a topical one."
SOURCE: Carlos JP. (1983) Comments on Fluoride. *Journal of Pedodontics* Winter. 135-136.

"Until recently most caries preventive programs using fluoride have aimed at incorporating fluoride into the dental enamel. The relative role of enamel fluoride in caries prevention is now increasingly questioned, and based on rat experiments and

reevaluation of human clinical data, it appears to be of minor importance... [A]ny method which places particular emphasis on incorporation of bound fluoride into dental enamel during formation may be of limited importance."
SOURCE: Fejerskov O, Thylstrup A, Larsen MJ. (1981). Rational Use of Fluorides in Caries Prevention: A Concept based on Possible Cariostatic Mechanisms. *Acta Odontologica Scandinavica* 39: 241-249.

Sodium Hexafluorosilicate
[CASRN 16893-85-9]

and

Fluorosilicic Acid
[CASRN 16961-83-4]

Review of Toxicological Literature

October 2001

Sodium Hexafluorosilicate
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[CASRN 16961-83-4]

Review of Toxicological Literature

Prepared for

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October 2001

Executive Summary

Nomination

Sodium hexafluorosilicate and fluorosilicic acid were nominated for toxicological testing based on their widespread use in water fluoridation and concerns that if they are not completely dissociated to silica and fluoride in water that persons drinking fluoridated water may be exposed to compounds that have not been thoroughly tested for toxicity.

Nontoxicological Data

Analysis and Physical-Chemical Properties

Analytical methods for sodium hexafluorosilicate include the lead chlorofluoride method (for total fluorine) and an ion-specific electrode procedure. The percentage of fluorosilicic acid content for water supply service application can be determined by the specific-gravity method and the hydrogen titration method. The American Water Works Association (AWWA) has specified that fluorosilicic acid contain 20 to 30% active ingredient, a maximum of 1% hydrofluoric acid, a maximum of 200 mg/kg heavy metals (as lead), and no amounts of soluble mineral or organic substance capable of causing health effects. Recently, single-column ion chromatography with conductometric detection and sodium hydroxide-methanol-water eluent was used for the simultaneous determination of fluorosilicic acid, Ca^{2+}, Mg^{2+}, Al^{3+}, Cl^-, and NO_3^- and successfully applied to the analysis of mineral water and composite tablets.

When heated to decomposition, sodium hexafluorosilicate releases toxic fumes of hydrogen fluoride and sodium oxide, while contact with metals releases hydrogen gas. In water, the compound readily dissociates to sodium ions and hexafluorosilicate ions and then to hydrogen gas, fluoride ions, and hydrated silica. At the pH of drinking water (6.5-8.5) and at the concentration usually used for fluoridation (1 mg fluoride/L), the degree of hydrolysis is essentially 100%. Fluorosilicic acid is a moderately strong acid that can corrode glass and stoneware. Like its salt, its degree of hydrolysis is essentially 100% in drinking water, and when reacted with steam or water or when heated to decomposition or highly acidified, toxic and corrosive fumes of fluorides (e.g., hydrogen fluoride and silicon tetrafluoride) are released. It also reacts with metals, producing hydrogen gas.

Commercial Availability, Production, and Uses

Sodium hexafluorosilicate is usually commercially available in technical and C.P. grades; it was formally available in insecticides of up to ~98% purity such as granular baits. A typical product contains 59.34% fluorine and a maximum of 0.50% each of water moisture, water-insoluble matter, and heavy metals (as lead). Fluorosilicic acid is commercially available as aqueous solutions (up to 70%) in technical and C.P. grades. A typical product contains a maximum of 23% of the acid, a minimum of 18.22% fluorine, a maximum of 0.02% heavy metals (as lead), and <1.00% hydrofluoric acid. Many U.S. producers and suppliers are available for both compounds (over 20 for each). Bulk producers/suppliers include Lucier Chemical Industries and Creanova Inc.

Sodium hexafluorosilicate is produced by treating fluorosilicic acid with sodium hydroxide, sodium carbonate, or sodium chloride; alkalinity is adjusted to avoid the release of the fluoride. Fluorosilicic acid is mainly produced as a byproduct of the manufacture of phosphate fertilizers

where phosphate rock is treated with sulfuric acid. It can also be made by the reaction of sulfuric acid on barium hexafluorosilicate, apatite, or fluorite (fluorspar).

The latest available figure for U.S. production of sodium hexafluorosilicate is 19,600 metric tons (43.2 million pounds) in 1984. In that same year, 3000 metric tons (6.61 million pounds) was imported. In 1995, ten phosphate rock processing plants produced 55,900 metric tons (123 million pounds) of fluorosilicic acid as a byproduct. In 1999, ten plants again reported on the production of fluorosilicic acid as a byproduct from phosphate rock processing; 69,200 metric tons (153 million pounds) was produced. This was an almost 3% increase in output from the previous year.

The major use of sodium hexafluorosilicate and fluorosilicic acid is as fluoridation agents for drinking water. Sodium hexafluorosilicate has also been used for caries control as part of a silicophosphate cement, an acidic gel in combination with monocalcium phosphate monohydrate, and a two-solution fluoride mouth rinse. Both chemicals are also used as a chemical intermediate (raw material) for aluminum trifluoride, cryolite (Na_3AlF_6), silicon tetrafluoride, and other fluorosilicates and have found applications in commercial laundry.

Other applications for sodium hexafluorosilicate include its use in enamels/enamel frits for china and porcelain, in opalescent glass, metallurgy (aluminum and beryllium), glue, ore flotation, leather and wood preservatives, and in insecticides and rodenticides. It has been used in the manufacture of pure silicon, as a gelling agent in the production of molded latex foam, and as a fluorinating agent in organic synthesis to convert organodichlorophosphorus compounds to the corresponding organodifluorophosphorus compound. In veterinary practice, external application of sodium hexafluorosilicate combats lice and mosquitoes on cattle, sheep, swine, and poultry, and oral administration combats roundworms and possibly whipworms in swine and prevents dental caries in rats. Apparently, all pesticidal products had their registrations cancelled or they were discontinued by the early 1990s.

Fluorosilicic acid is used in the tanning of animal hides and skins, in ceramics and glass, in technical paints, in oil well acidizing, in the manufacture of hydrogen fluoride, for the sterilization of equipment (e.g., in brewing and bottling establishments and for copper and brass vehicles), and in electroplating. It is also employed as an impregnating ingredient to preserve wood and harden masonry and for the removal of mold as well as rust and stain in textiles.

Environmental Occurrence and Persistence

Fluorosilicic acid (30-35%) can readily be recovered in the hydrogen fluoride process from the silicon tetrafluoride-containing plant vent gases, as well as from wet-process phosphoric acid plants. In the manufacture of phosphate fertilizer in Central Florida, fluorides and radionuclides (radium and uranium) are released as toxic pollutants. During the acidulation process, radon gas can be released and carried into the fluorosilicic acid, while polonium can be captured during the scrubbing process and combined with fluoride.

For drinking water fluoridation, the maximum use level (MUL) for sodium hexafluorosilicate is 2 mg/L; for fluorosilicic acid, the level is 6 mg/L of a 25% fluorosilicic acid solution. Both values correspond to a fluoride concentration of 1.2 mg/L, which is below the U.S.

Environmental Protection Agency's (EPA's) Maximum Contaminant Level (MCL) of 4.0 mg/L and the Secondary Maximum Contaminant Level (SMCL) of 2.0 mg/L. The National Sanitation Foundation (NSF) has established a Maximum Drinking Water Level of 16 mg/L for silicates and a Maximum Allowable Level (MAL) of 1.2 mg fluoride/L for its certified products used in drinking water.

Human Exposure

Potential exposure to sodium hexafluorosilicate and fluorosilicic acid is via inhalation and eye and skin contact. Another route for the former compound is ingestion. Although current data indicate that silicofluorides are used in over 9200 U.S. water treatment systems, serving over 120 million individuals, exposure via drinking water is expected to be minimal since both compounds hydrolyze almost completely under these conditions.

In the workplace, exposure to both chemicals is possible during their manufacture, transportation, or use in water treatment. In the National Institute for Occupational Safety and Health (NIOSH) 1983 National Occupation Exposure Survey (NOES), 79,556 employees were potentially exposed to sodium hexafluorosilicate, while 10,867 were potentially exposed to fluorosilicic acid.

Regulations

Workers treating agricultural products with insecticides such as weevil baits and persons using roach baits and other insecticidal products containing sodium hexafluorosilicate in the home may have been exposed by inhalation or the skin, and by hand-to-mouth contact. In the United States, all pesticide uses of sodium hexafluorosilicate have been cancelled. (It is noted that its use as an insecticide is currently listed in the *2001 Farm Chemicals Handbook*, which does not note discontinuation of the product Safsan.) Both sodium hexafluorosilicate and fluorosilicic acid are listed in Section 8(b) of the Toxic Substances Control Act (TSCA; chemical inventory section). Both are also exempt from reporting under the Inventory Update Rule (i.e., Partial Updating of the TSCA Inventory Data Base Production and Site Reports [40CFR, Section 710(b)]). The Occupational Safety and Health Administration (OSHA) and American Conference of Governmental Industrial Hygienists (ACGIH) have established an eight-hour time-weighted average (TWA) of 2.5 mg/m^3 fluorides, as fluorine, for work place exposure. NIOSH has also recommended an air exposure level to inorganic fluorides of 2.5 mg F/m^3 but as a ten-hour TWA.

Toxicological Data

Human Data

Chronic exposure to sodium hexafluorosilicate dust at levels above the eight-hour TWA can result in severe calcification of the ribs, pelvis, and spinal column ligaments; effects on the enzyme system; pulmonary fibrosis; stiffness; irritation of the eyes, skin, and mucous membranes; weight loss; anorexia; anemia; cachexia; wasting; and dental effects. Long-term or repeated exposure to the skin can result in skin rash. A probable oral lethal dose of 50-500 mg/kg, classified as very toxic, has been reported for a 150-pound (70-kg) person receiving between 1 teaspoon and 1 ounce of sodium hexafluorosilicate. Cases of sodium hexafluorosilicate ingestion reported symptoms such as acute respiratory failure, ventricular

tachycardia and fibrillation, hypocalcemia, facial numbness, diarrhea, tachycardia, enlarged liver, and cramps of the palms, feet, and legs.

The symptoms of inhalation of fluorosilicic acid include burning of the eyes and numbness around the lips. Symptoms do not necessarily occur immediately; they can appear 24 hours after exposure. A spill incident of the chemical on an interstate in Florida, covering an area 600 feet long and 60 feet wide, resulted in the visit of more than 50 people to hospitals. Individuals complained of skin and respiratory irritation, including burning in the throat, and headaches. A man riding in a truck with his arm out the window experienced burning on his forearm. The effects of long-term exposure to fluorosilicic acid are changes in bone, corrosivity of the mucous membranes (e.g., ulceration of the nose, throat, and bronchial tubes), coughing, shock, pulmonary edema, fluorosis, coma, and even death. In workers engaged for approximately 30 years in the production of phosphate fertilizers, nine out of the 50 observed workers had increased bone densities. When swallowed, severe irritation of the lungs, nose, and throat can occur, as well as severe damage to the throat and stomach. A probable oral lethal dose of 50-5000 mg/kg, classified as very toxic, has been reported for doses between 1 teaspoon and 1 ounce for a 150-pound (70-kg) person; a probable oral lethal dose of 5-50 mg/kg, classified as extremely toxic, has been reported for doses between 7 drops and 1 teaspoon for the same individual.

Chemical Disposition, Metabolism, and Toxicokinetics

In a female chemical plant worker who ingested sodium hexafluorosilicate in a suicide attempt, fluoride levels in serum and fresh urine were 5.130 and 235.60 mg/dm^3, respectively, on day 2 of hospitalization; treatment with calcium compounds (calcium carbonate and calcium lactogluconate) immediately returned levels to normal. In 50 workers engaged for approximately 30 years in the production of phosphate fertilizers and exposed to gaseous fluoride (hydrogen fluoride, silicon tetrafluoride, and fluorosilicic acid), urine fluoride excretion ranged from 1.0 to 9.6 mg F^-/L (controls: 0.3 to 1.2).

In rats fed a diet containing 0.16% sodium hexafluorosilicate supplemented in a corn-soybean oilmeal-casein ration *ad libitum* for 22-23 days, the average amounts of fluorine were 94.4 mg in feces and 91.9 mg in urine. The mean amount of fluorine absorbed was 65.1% and that retained was 31.0%.

Fluorine concentrations in stomach/rumen contents, urine, and blood serum have been determined in domestic animals experiencing sodium hexafluorosilicate poisoning. Significantly elevated levels were initially found, which decreased with time.

Acute Toxicity

In mice, an oral LD_{50} of 70 mg/kg (0.37 mmol/kg) for sodium hexafluorosilicate was reported. In rats, oral LD_{50} values of 125 and 430 mg/kg (0.665 and 2.29 mmol/kg, respectively) were calculated, while a TD_{Lo} of 248 mg/kg (1.32 mmol/kg) was calculated. A subcutaneous LD_{Lo} of 70 mg/kg (0.37 mmol/kg) was also reported in the animals. In rabbits, the oral LD_{50} value was 125 mg/kg (0.665 mmol/kg). In guinea pigs, an LC_{Lo} value of 33 mg/kg (0.18 mmol/kg) for sodium hexafluorosilicate was observed; additionally, an oral LD_{50} of 200 mg/kg (1.39 mmol/kg) was reported for fluorosilicic acid.

Sodium Hexafluorosilicate: Mice orally given sodium hexafluorosilicate (70 mg/kg; 0.37 mmol/kg) exhibited toxic effects in the peripheral nerves, sensation, and in behavior. In rats, an oral dose (248 mg/kg; 1.32 mmol/kg) administered intermittently for one month produced toxic effects in the kidney, ureter, and/or bladder, as well as musculoskeletal and biochemical effects. Using guinea pigs, inhalation experiments (13-55 mg/m^3 [1.7-7.2 ppm] sodium hexafluorosilicate in air for ≥6 hours) resulted in pulmonary irritation; the lowest concentration that caused death was 33 mg/m^3 (4.3 ppm).

When sodium hexafluorosilicate (500 mg; 2.66 mmol) was applied to the skin of adult rabbits, mild irritation occurred. When applied to the eyes (100 mg; 0.532 mmol), severe irritation was observed; following a four-second rinse, the effect was still severe.

Sodium hexafluorosilicate poisoning has been reported in domestic animals (cattle, sheep, a horse, and a pigeon). Animals exhibited drowsiness, constipation, loss of appetite, paresis of the rumen, severe abdominal pain, and diarrhea. Sheep also exhibited grinding of the teeth (an indication of pain) and frothing at the mouth in most cases of lethal poisoning, while the horse also had bradycardia. In a study in which sheep were orally administered technical sodium hexafluorosilicate (25, 50, 200, 1500, and 2000 mg/kg; 0.13, 0.27, 1.06, 7.976, and 10.63 mmol/kg) via stomach tube, the animals exhibited similar symptoms. Animals died 6 days after administration of 200 mg/kg and 2.5 hours after administration of 2000 mg/kg. When a dairy herd of 600 animals was acutely poisoned from railcar contamination of feed, 95% of the animals had decreased neuromuscular transmission. The poisoning resembled calcium depletion.

Fluorosilicic Acid: In rats orally given fluorosilicic acid (430 mg/kg; 2.98 mmol/kg), somnolence and/or general depressed activity was observed. Other rat studies with fluorosilicic acid (single oral doses of 215, 464, 1000, and 2100 mg/kg [1.49, 3.22, 6.939, and 14.57 mmol/kg]) led to its classification as "moderately toxic." Percutaneous administration of the compound (amounts not provided) in rats, guinea pigs, and pigs resulted in continuously spreading necrosis in the deeper regions of injured skin. Hypocellular necrosis, consisting of sharp leukocyte demarcations, and edema up to the subcutis were also observed. In rabbits, it was corrosive to the skin (0.5 mL [4 mol] for 1, 24, or 72 hours) and eyes (0.1 mL [0.8 mol] instilled into left eye).

Synergistic/Antagonistic Effects

Fluoride, administered in the form of sodium hexafluorosilicate, had a strong affinity for calcium and magnesium. When orally given to sheep via a stomach tube at doses of 25, 50, 200, 1500, and 2000 mg/kg, increased changes in serum calcium and magnesium levels were observed at the two highest doses within 30 minutes after dose administration. At 200 mg/kg, recovery of both levels occurred after five days. With the 1500 mg/kg dose group, changes in phosphorus and sugar levels in whole blood were also significantly increased.

Genotoxicity

Sodium hexafluorosilicate was negative in the Salmonella/microsome test (concentrations up to 3600 g/plate, –S9), the micronucleus test on mouse bone marrow (37.2 mg/kg; 0.198 mmol/kg), and in the *Bacillus subtilis* rec-assay system (0.001-10 M; 188 g/mL-1.9 g/mL).

The compound (0.25 mM; 47 g/mL) did not induce sex-linked recessive lethal mutations in *Drosophila*.

Other Data

Within one week after beginning work in a foam rubber plant, a 23-year-old man exhibited skin lesions consisting of "diffuse, poorly delineated, erythematous plaques with lichenoid papules and large pustules" on his arms, wrists, thighs, and trunk. Although scratch and patch tests with sodium hexafluorosilicate (2% aqueous) were negative, tests in rabbits (topical application of a 1, 5, 10, and 25% solution) showed the compound to be a pustulogen.

No short-term or subchronic exposure, chronic exposure, cytotoxicity, reproductive toxicity, teratology, carcinogenicity, or initiation/promotion studies were available.

Structure-Activity Relationships

For the same fluorine content, sodium fluoride, sodium hexafluorosilicate, cryolite (Na_3AlF_6), and barium sulfate were observed to have the same extent of chronic fluorine intoxication in rats. Ammonium fluoride, potassium fluoride, barium fluorosilicate, potassium fluorosilicate, and sodium fluorosilicate exhibited the same acute toxicity as sodium fluoride in the animals.

In a comparative study of absorption and excretion of fluorine in rats fed sodium fluoride, calcium fluoride, and sodium hexafluorosilicate, the percent fluorine retained was the same for the two sodium compounds. Several experiments on growing rats orally given 5, 10, 15, 25, and 50 ppm fluorine as sodium fluoride or sodium hexafluorosilicate for 90-100 days found no differences in the quantity of fluorine deposited and the contents of ash, calcium, and phosphorus in the incisor teeth, molar teeth, mandibles, and femurs. Furthermore, there were no differences in the percent of ingested fluorine retained in the body, and a combination of sodium silicate (15 ppm silicon) with sodium fluoride (25 ppm fluorine) did not affect the amount of fluorine deposited. The growth rate was normal in all rats. A separate study using litters of female weanling Osborne-Mendel rats that were given 50 ppm fluorine as sodium fluoride or ammonium fluorosilicate in drinking water for 99 days observed similar results.

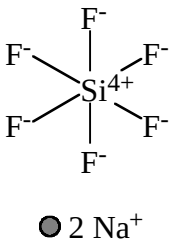
Table of Contents

1.0 Basis for Nomination

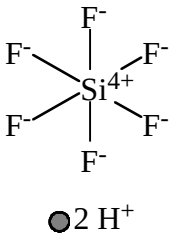
Sodium hexafluorosilicate and fluorosilicic acid were nominated for toxicological testing based on their widespread use in water fluoridation and concerns that if they are not completely dissociated to silica and fluoride in water that persons drinking fluoridated water may be exposed to compounds that have not been thoroughly tested for toxicity.

2.0 Introduction

Sodium Hexafluorosilicate
[16893-85-9]



Fluorosilicic Acid
[16961-83-4]



2.1 Chemical Identification and Analysis

2.1.1 Sodium Hexafluorosilicate

Sodium hexafluorosilicate ([Na_2SiF_6]; mol. wt. = 188.06) is also called:

Destruxol applex
Disodium hexafluorosilicate[a,b,d]
Disodium silicofluoride
Ens-zem weevil bait
ENT 1,501
Fluorosilicate de sodium
Fluosilicate de sodium
Ortho earwig bait
Ortho weevil bait
Prodan
Prodan (pesticide)
PSC Co-Op weevil bait
Safsan

Salufer
Silicate (2^-), hexafluoro-, disodium (8CI, 9CI)
Silicon sodium fluoride[a,b,c]
Sodium fluoride silicate
Sodium fluorosilicate[a,b]
Sodium fluosilicate[a,b,e]
Sodium hexafluosilicate
Sodium silicofluoride[a,b]
Sodium silicon fluoride[a,b]
Super prodan
UN2674 (DOT)

May be written as the following: [a]without any appended formula; [b]with Na_2SiF_6 appended in parentheses, [c]with $SiNa_2F_6$ appended in parentheses, [d]with (2^-) appended in parentheses, or [e]with ACN (accepted common name) appended in parentheses.

Sources: HSDB (2000b); Registry (2000); RTECS (2000); SANSS (2000)

Other CAS Registry Numbers (CASRNs) that have been used for the compound are 1310-02-7, 1344-04-3, 12656-12-1, 39413-34-8, 221174-64-7 (Registry, 2000). CASRNs for the hydrates are 10213-79-3 (pentahydrate), 15630-83-8 (hexahydrate), 27121-04-6 (octahydrate), and 13517-24-3 (nonahydrate). AOAC (Association of Official Analytical Chemists) Method 945.05 has been used to detect fluorine as sodium hexafluorosilicate in pesticide formulations (HSDB, 2000b). The chemical composition of sodium hexafluorosilicate used in water supply service applications can be determined by test procedures specified in AWWA (American Water Works Association) B702-99 (AWWA, 1999).

2.1.2 Fluorosilicic Acid

Fluorosilicic acid[e] ($[H_2SiF_6]$; mol. wt. = 144.11) is also called:

Dihydrogen hexafluorosilicate[a,c]
FKS
Fluosilicic acid[a,d] (6CI)
Hexafluorosilicic acid
Hexafluorosilicate (2^-), dihydrogen
Hexafluosilicic acid
Hydrofluorosilicic acid[a,e]
Hydrofluosilicic acid[a,d]
Hydrogen hexafluorosilicate[a,b]
Hydrogen hexafluorosilicic
Hydrosilicofluoric acid[a,e]
Sand acid[a,e]
Silicate (2^-), hexafluoro-, dihydrogen (8CI, 9CI)
Silicic acid (H_2SiF_6)
Silicofluoric acid[a,e]
Silicofluoride
Silicon hexafluoride dihydride
UN1778 (DOT)

May be written as the following: [a]without any appended formula; [b]with H_2SiF_6 appended in parentheses, [c]with (2^-) appended in parentheses, [d]with ACN (accepted common name) appended in parentheses, or [e]with DOT (Department of Transportation) appended in parentheses.

Sources: HSDB (2000a); Registry (2000); RTECS (2000); SANSS (2000)

Other CASRNs that have been used for the compound are 1309-45-1 and 12672-67-2 (Registry, 2000). Total fluorine in fluorosilicates can be detected by the lead chlorofluoride method. In air, an ion-specific electrode procedure with a range of 0.05 to 475 mg fluoride/m^3 has been used (HSDB, 2000a). The percentage of fluorosilicic acid content for water supply service application can be determined by the specific-gravity method and the hydrogen titration method (specified in AWWA B703-94); the latter is the preferred method, since the former procedure provides a "very rough estimation." AWWA has specified that fluorosilicic acid must contain 20 to 30% active ingredient, a maximum of 1% hydrofluoric acid, a maximum of 200 mg/kg heavy metals (as lead), and no amounts of soluble mineral or organic substance that can cause health effects (AWWA, 2000; HSDB, 2000a). Analyses of tap water treated with silicofluorides (e.g., samples from Seattle, WA, San Francisco, CA, and Ft. Collins, CO) have revealed insignificant lead and arsenic levels (CSDS, 2001). Recently, single-column ion chromatography with conductometric detection and sodium hydroxide-methanol-water eluent was used for the simultaneous determination of fluorosilicic acid, Ca^{2+}, Mg^{2+}, Al^{3+}, Cl^-, and NO_3^-; the detection limit for the anion of the acid was 1.25×10^6 M. It was successfully applied to the analysis of mineral water and composite tablets (Xu et al., 2001).

2.2 Physical-Chemical Properties

Property	Information	Reference(s)
Sodium hexafluorosilicate		
Physical State	white, granular, crystalline, or free-flowing powder; white hexagonal crystals	HSDB (2000b)
Odor	odorless	
Boiling Point (°C)	decomposes at 500	LCI, Ltd. (2000b)
Melting Point (°C)	melts at red heat with decomposition	HSDB (2000b)
Specific Gravity (g/cm^3)	2.7	
pH Value	neutral (solution in cold water)	
	3.0-4.5 (1% solution)	LCI, Ltd. (2000b)
Water Solubility	soluble in cold water (150 parts) and boiling water (40 parts)	HSDB (2000b)
mg/L or g/m^3 at 17.5 ¡C	6,500	Worthing (1987; cited by Shiu et al., 1990)
mg/L or g/m^3 at 20 ¡C	72,000	Dean (1985; cited by Shiu et al., 1990)
Insoluble in	alcohol (e.g., ethanol)	HSDB (2000b)
Fluorosilicic acid		
Physical State	colorless liquid; white crystals	HSDB (2000a)
Odor	sour, pungent	
Density @ 25 ¡C	1.4634 (60.97% solution)	
Boiling Point (°C)	decomposes (60.97% solution)	
	105 (25% solution)	LCI, Ltd. (2000a)
Freezing Point (°C)	-15.5 (25% solution)	
Specific Gravity (g/cm^3)	1.234 (25% solution) @ 16 ¡C	LCI, Ltd. (2000a)
pH Value	1.2 (1% solution)	LCI, Ltd. (undated-a)
Soluble in	alkali; cold and hot water	HSDB (2000a)

In alkaline medium, fluorosilicate solutions are readily hydrolyzed; in acidic conditions, silicon tetrafluoride and hydrogen fluoride are released. Thermal decomposition of fluorosilicates releases gaseous silicon tetrafluoride and forms solid fluoride. When heated to decomposition,

sodium hexafluorosilicate releases toxic fumes of hydrogen fluoride and sodium oxide; contact with metals can release hydrogen gas (HSDB, 2000b; NICNAS, 2001).

Fluorosilicic acid is a moderately strong acid that can corrode glass and stoneware. At about 19 ˚C, a 60-70% solution solidifies, forming crystalline dihydrate. A 13.3% solution may be distilled without decomposition. Fluorosilicic acid is deliquescent that is, it absorbs moisture from the air and becomes liquid (HSDB, 2000a). It produces toxic and corrosive fumes of fluorides (e.g., hydrogen fluoride and silicon tetrafluoride) when reacted with water or steam or when the compound is heated to decomposition or highly acidified with sulfuric acid (HSDB, 2000a; NICNAS, 2001). It also reacts with many metals, producing hydrogen gas (HSDB, 2000a; LCI, Ltd., undated-a).

Aqueous Chemistry

In water, the compound readily dissociates to sodium ions and hexafluorosilicate ions. At the pH of drinking water (6.5-8.5) and at the concentration usually used for fluoridation (1 mg fluoride/L), essentially 100% of sodium hexafluorosilicate dissociates to fluoride ions and hydrated silica (Crosby, 1969; Urbansky and Schock, 2000). In a quasi-constant composition titration study using high concentrations of hydrogen ion (H^+) and calcium ion (Ca^{2+}), the promoting effect of Ca^{2+} on the hydrolysis of sodium hexafluorosilicate was observed to be stronger than the inhibiting effect of H^+, thereby causing faster hydrolysis at low pH (Eidelman and Chow, 1991).

$$Na_2SiF_6(aq) + 4\ H_2O \quad 4\ HF(aq) + 2\ NaF(aq) + Si(OH)_4(aq)$$

In water, fluorosilicic acid readily hydrolyzes to hydrofluoric acid and various forms of amorphous and hydrated silica. At the concentration usually used for water fluoridation, 99% hydrolysis occurs and the pH drops to 4.2. As pH increases, hydrolysis increases. At the pH of drinking water, the degree of hydrolysis is "essentially 100%" (Crosby, 1969; Urbansky and Schock, 2000).

$$H_2SiF_6(aq) + 4\ H_2O \quad 6\ HF(aq) + Si(OH)_4(aq)$$

2.3 Commercial Availability

Sodium hexafluorosilicate is available as granular bait and in technical and C.P. grades. It is usually commercially available as ~98% pure (HSDB, 2000b). A typical product contains 59.34% fluorine and a maximum of 0.50% each of moisture as water, water-insoluble matter, and heavy metals (as lead) (LCI, Ltd., 2000b). Chemical producers include Chemtech Products Inc. (Alorton, IL), IMC-Agrico Company (Faustina, LA), and Kaiser Aluminum and Chemical Corporation (Mulberry, FL) (SRI Int., 2000). Lucier Chemical Industries produces and ships sodium hexafluorosilicate in 25-kg bags and 50-pound bags (LCI, Ltd., 2000b). It is supplied by GFS Chemicals Inc. (Powell, OH) and Spectrum Chemical Manufacturing Corporation (Gardena, CA) (Chemcyclopedia Online, 2001). Chem Sources (2001) has identified 24 suppliers of the compound; bulk suppliers include Creanova Inc. (Somerset, NJ) and Seal Chemical Industries (Newport Beach, CA). RIMI Chemicals Company Ltd. formulates the chemical as the product Safsan (Farm Chem. Handbook, 2001).

Fluorosilicic acid is commercially available as aqueous solutions of 5, 10, 15, 20, 25, 30, 34, and 60-70% in technical and C.P. grades (HSDB, 2000a). A typical product contains a minimum of 23% of the acid, a minimum of 18.22% fluorine, a maximum of 0.02% heavy metals (as lead), and <1.00% hydrofluoric acid (LCI, Ltd., 2000a). It is produced by Cargill Fertilizer, Inc. (Riverview, FL), Chemtech Products Inc. (Alorton, IL), Farmland Hydro, L.P. (Bartow, FL), IMC-Agrico Company (Faustina, LA; Nichols, FL; South Pierce, FL; Uncle Sam, LA), PCS Phosphate Company, Inc. (Aurora, NC), Royster-Clark Inc. (Americus, GA; Florence, AL; Hartsville, SC), and U.S. Agri-Chemicals Corporation (Fort Meade, FL) (SRI Int., 2000). Cargill Fertilizer, Inc. produces fluorosilicic acid as a primary nutrient (Farm Chem. Handbook, 2001). Another producer, Lucier Chemical Industries (Jacksonville Beach, FL) ships its product in tank cars, tank trucks, and drums (LCI, Ltd., 2000a). Chem Sources (2001) has identified 16 suppliers of fluorosilicic acid; bulk suppliers include Creanova Inc. (Somerset, NJ), Fluka (Milwaukee, WI), and Spectrum Laboratory Products, Inc. (Gardena, CA). Under the name hydrofluorosilicic acid [56977-47-0], it is supplied by Alfa Aesar/Johnson Matthey (Ward Hill, MA) and Solvay Fluorides Inc. (St. Louis, MO) (Chemcyclopedia Online, 2001).

3.0 Production Processes

Sodium hexafluorosilicate is produced by the neutralization of fluorosilicic acid with sodium hydroxide, sodium carbonate, or sodium chloride under vigorous agitation. The amount of the alkali is controlled so as not to result in the fluoride (HSDB, 2000b).

Fluorosilicic acid is mainly produced as a byproduct of the manufacture of phosphate fertilizers where phosphate rock, containing fluorides and silica or silicates, is treated with sulfuric acid. The gases released, hydrogen fluoride and silicon tetrafluoride, are sprayed with water in condensing towers or drawn into a series of scrubbers and dissolved in water, forming an aqueous solution of fluorosilicic acid (CSDS, 2001; Farm Chem. Handbook, 2001; NICNAS, 2001). This is the crude form of fluorosilicic acid; the purified form is obtained by distillation of the crude acid or by reacting pure silica with hydrofluoric acid. The compound can also be made by the reaction of sulfuric acid on barium hexafluorosilicate (HSDB, 2000a). Furthermore, fluorosilicic acid is manufactured by the reaction of apatite and/or fluorite (fluorspar) with sulfuric acid (LCI, Ltd., 2000a). Its production from phosphoric acid producers supplements fluorspar as a domestic source of fluorine (Miller, 1995, 1999).

4.0 Production and Import Volumes

The latest available figure for U.S. production of sodium hexafluorosilicate is 19,600 metric tons (43.2 million pounds) in 1984. In that same year, 3000 metric tons (6.61 million pounds) was imported (HSDB, 2000b).

In 1995, ten phosphate rock processing plants produced 55,900 metric tons (123 million pounds) of fluorosilicic acid as a byproduct. Of this amount, 45% was used in water fluoridation, directly or as the sodium salt, while 34% went toward the production of aluminum trifluoride and 20% went toward other uses (Miller, 1995). In 1999, ten plants again reported on the production of fluorosilicic acid as a byproduct from phosphate rock processing; 69,200 metric tons (153 million pounds) was produced, and 69,100 metric tons (152 million pounds) was sold or used. This was an almost 3% increase in output from the previous year. The amount used for water fluoridation was 34, 900 metric tons (51%), while 19,000 metric tons (27%) was used for aluminum trifluoride production, and 15,300 metric tons (22%) was used for other uses such as

sodium hexafluorosilicate production (Miller, 1999). The latest figures are definitely an increase compared to the 1975 and 1976 U.S. production of the acid at 30,000 metric tons (66 million pounds) from phosphoric acid manufacturing. No import data were found (HSDB, 2000a).

5.0 Uses

The major use of sodium hexafluorosilicate and fluorosilicic acid is as fluoridation agents for drinking water (HSDB, 2000a,b; Urbansky and Schock, 2000). They have been added to water since the mid-1940s to prevent tooth decay (Chem. Mark. Rep., 2000). Sodium hexafluorosilicate has also been used for caries control as part of a silicophosphate cement and as an acidic gel in combination with monocalcium phosphate monohydrate (Jinks et al., 1982 abstr.; Takagi et al., 1992). As part of a two-solution fluoride mouth rinse, it resulted in enhanced remineralization of human enamel lesions and root lesions (Takagi et al., 1997; Chow et al., 2000).

Both chemicals are also used as a chemical intermediate (raw material) for aluminum trifluoride, cryolite (Na_3AlF_6), silicon tetrafluoride, and other fluorosilicates (HSDB, 2000a,b). In addition, they have found applications in commercial laundry; sodium hexafluorosilicate acts as a laundry souring agent and the acid acts as a neutralizer for alkalis (LCI, Ltd., 2000a,b).

Other applications for sodium hexafluorosilicate include its use in enamels/enamel frits for china and porcelain, in opalescent glass, metallurgy (aluminum and beryllium), glue, ore flotation, leather and wood preservatives, and in insecticides and rodenticides (e.g., moth repellent and for the control of Noctuid larvae [i.e., cotton leafworms, mole crickets, grasshoppers, locusts, crane flies, earwigs, and sowbugs]) (HSDB, 2000b; LCI, Ltd. 2000b; Farm Chem. Handbook, 2001). It has been used in the manufacture of pure silicon and as a gelling agent in the Dunlop process (production of molded latex foam) (HSDB, 2000b). Recently, it has been used in organic synthesis as a fluorinating agent to convert organodichlorophosphorus compounds to the corresponding organodifluorophosphorus compound in low to moderate yields (up to 75%) (Farooq, 1998). In veterinary practice, externally applied sodium hexafluorosilicate has been used to combat lice and mosquitoes on cattle, sheep, swine, and poultry. It has been given orally to combat roundworms and possibly whipworms in swine and added to feed (50 ppm) to prevent dental caries in rats (HSDB, 2000b). Sodium hexafluorosilicate is listed as an oral care agent on the International Nomenclature of Cosmetic Ingredients inventory established under a European Commission Directive (96/335/EC) (INCI, 1998).

Fluorosilicic acid is used in the tanning of animal hides and skins, in ceramics and glass (glass etching), in technical paints, in oil well acidizing, and in the manufacture of hydrogen fluoride. It is also employed as an impregnating ingredient to preserve wood and harden masonry and for the removal of mold as well as rust and stain in textiles. It has been used for the sterilization of equipment (e.g., in brewing and bottling establishments and for copper and brass vehicles) as well as in electroplating (HSDB, 2000a; LCI, Ltd., 2000a). A typical electrolyte contains 95 g/L free fluorosilicic acid (King and Ramachandran, 1995). In the electrolytic refining of lead, the electrolyte contains 33% of the acid (Howe, 1981).

6.0 Environmental Occurrence and Persistence

In the hydrogen fluoride process, fluorosilicic acid (30-35%) can readily be recovered from the silicon tetrafluoride-containing plant vent gases, which are absorbed in water. It can also be

recovered from wet-process phosphoric acid plants and then processed to form hydrogen fluoride (Smith, 1994; Woytek, 1980). In this process, 45-60% gaseous fluorine compounds are recoverable. The fluorosilicic acid is usually disposed of by converting it into inert and harmless waste products; usually, neutralization with limestone or milk of lime is done to precipitate the acid as a mixture of calcium fluoride and silica. However, small amounts of poisonous fluorine compounds remain in the effluent (Denzinger et al., 1979).

The manufacture of phosphate fertilizer in Central Florida releases not only fluorides as a toxic pollutant but also radionuclides. Radium wastes come from the filtration systems. Uranium and its decay-rate products are found in the phosphate rock and fertilizer as well as the byproduct fluorosilicic acid. During the wet-process procedure, trace amounts of both radium and uranium are captured in the scrubbers and therefore are in the fluorosilicic acid. During the acidulation process yielding phosphoric acid, radon gas in the phosphate pebbles can be released and carried into the fluorosilicic acid, while polonium can be captured during the scrubbing process and then can combine with fluoride (Glasser, undated).

The Centers for Disease Control (CDC) and EPA recommended levels for fluoride in drinking water ranges from 0.6-1.2 ppm (CSDS, 2001). For drinking water fluoridation, the maximum use level (MUL) for sodium hexafluorosilicate is 2 mg/L; for fluorosilicic acid, the level is 6 mg/L of a 25% fluorosilicic acid solution. Both values correspond to a fluoride concentration of 1.2 mg/L, which is below the U.S. Environmental Protection Agency's (EPA's) Maximum Contaminant Level (MCL) of 4.0 mg/L and the Secondary Maximum Contaminant Level (SMCL) of 2.0 mg/L. Although EPA has no MCL for silicate in drinking water, the National Sanitation Foundation (NSF) has established a Maximum Drinking Water Level of 16 mg/L for silicates. For NSF Certified Products used in drinking water, the Maximum Allowable Level (MAL) for fluoride is 1.2 mg/L; the MUL of the products ranges from 4 to 6.6 mg/L (NSF Int., 2000a). At its plant in Riverview, FL, Cargill Fertilizer, Inc. had an MUL of 8 mg/L sodium hexafluorosilicate (equivalent to 1.2 mg/L fluoride) for fluoridation (NSF Int., 2001). While the majority of 29 manufacturers of fluorosilicic acid had an MUL of 6 mg/L, a level of 6.6 mg/L was measured at the IMC-Agrico Company plant at Uncle Sam, LA. [The Hydrite Chemical Company's MUL was 1.7 mg/L at three plants, while the American Development Corporation had an MUL of 4 mg/L at two plants] (NSF Int., 2000b).

7.0 Human Exposure

Potential exposure to sodium hexafluorosilicate is via inhalation of dusts, ingestion, and eye and skin contact (HSDB, 2000b). The main routes of entry of fluorosilicic acid are inhalation and eye and skin contact (HSDB, 2000a; LCI, Ltd., undated-a).

Exposure to sodium hexafluorosilicate is possible from its use to control crawling insects in homes and work buildings. The chemical has "high inherent toxicity," and children may ingest the material from crawling on the floors of treated houses (U.S. EPA, 1999).

In 1992, 5876 U.S. public water suppliers were using fluorosilicic acid and 1635 utilities were using its sodium salt for water fluoridation, serving greater than 80 and 36 million persons, respectively (Urbansky and Schock, 2000). Currently, silicofluorides are used in over 9200 U.S. water treatment systems, serving over 120 million individuals (CSDS, 2001). Exposure via drinking water is, however, expected to be minimal, since at concentrations used in water

fluoridation and at the normal pH of drinking water, both compounds hydrolyze almost completely (see Section 2.2) (Urbansky and Schock, 2000). At equilibrium, the hexafluorosilicate remaining in drinking water is estimated to be <<1 parts per trillion (Urbansky and Schock, 2000). In addition, exposure to impurities in the fluoridating agent is judged to be of low health risk when properly treated water is ingested. For example, in fluorosilicic acid, iron and iodine are usually below the levels considered useful as a dietary supplement; the phosphorus level is reported to be insignificant; and silver is usually <4 parts per septillion in the fluoridated water (CSDS, 2001).

In the workplace, exposure to both chemicals is possible during their manufacture, transportation, or use in water treatment (HSDB, 2000a,b). In the NIOSH 1983 National Occupational Exposure Survey (NOES) of 8057 facilities, 74 industries, and 60 occupations, 79,556 employees were potentially exposed to sodium hexafluorosilicate; the total number of female employees potentially exposed was 22,185. In the 1983 NOES of 1758 facilities, 19 industries, and 15 occupations, 10,867 employees were potentially exposed to fluorosilicic acid; the total number of females potentially exposed was 2068 (RTECS, 2000).

8.0 Regulatory Status

Under EPA's Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), sodium hexafluorosilicate as a pesticide was subject to registration or re-registration in 1988 (RTECS, 2000). In August 1995, the act was amended, eliminating fluorosilicate compounds from the registration list and their sale for pesticide use (40CFR153, Subpart H) (U.S. EPA, 1995). In the United States, all pesticide uses have been cancelled (U.S. EPA, 1999). The registrations of insecticide formulations containing 0.18% to 98.5% sodium hexafluorosilicate, some on the market since the late 1940s, were cancelled in the late 1980s and early 1990s. Target organisms included roaches, moths, and weevils. Other cancelled fluorosilicate products were formulated with sodium aluminum fluorosilicate or aluminum fluorosilicate (NPIRS¤, 2001). [It is noted that the use of sodium hexafluorosilicate as an insecticide is currently listed in the *2001 Farm Chemicals Handbook* (see Section 5.0).] Both sodium hexafluorosilicate and fluorosilicic acid are listed in Section 8(b) of the Toxic Substances Control Act (TSCA; chemical inventory section). Both are also exempt from reporting under the Inventory Update Rule (i.e., Partial Updating of the TSCA Inventory Data Base Production and Site Reports [40CFR, Section 710(b)]) (TSCAINV, 2000). The Occupational Safety and Health Administration (OSHA) and American Conference of Governmental Industrial Hygienists (ACGIH) have established an eight-hour time-weighted average (TWA) of 2.5 mg/m^3 fluorides, as fluorine. OSHA has established this Permissible Exposure Limit (PEL) for the general industry (29CFR1910.1000), construction (29CFR1915.1000), shipyard (29CFR1926.55), and federal contracts (41CFR50-204.50). The ACGIH short-term excursion limit (STEL) recommendation is that excursions in worker exposure levels may exceed three times the threshold limit value (TLV)-TWA for no more than 30 minutes during a work day and not exceed five times the TLV-TWA, provided that the TLV-TWA is not exceeded. ACGIH has listed fluorides, as fluorine, as "A4 not classifiable as a human carcinogen" (HSDB, 2000b; RTECS, 2000). NIOSH has also recommended an air exposure level to inorganic fluorides of 2.5 mg F/m^3 but as a ten-hour TWA (RTECS, 2000).

9.0 Toxicological Data

9.1 General Toxicology

Chronic ingestion of excessive amounts of fluoride produces osteosclerosis and mottled tooth enamel. Chronic exposure increases osteoblastic activity as well as the density and calcification of bone (Gilman et al., 1980; cited by HSDB, 2000a).

9.1.1 Human Data

Sodium Hexafluorosilicate

Chronic exposure to dust at levels above the PEL or TLV can result in severe calcification of the rib, pelvis, and spinal column ligaments; effects on the enzyme system; pulmonary fibrosis; stiffness; irritation of the eyes, skin, and mucous membranes; weight loss; anorexia; anemia; cachexia; wasting; and dental effects. Long-term or repeated exposure to the skin can result in skin rash (LCI, Ltd., undated-b). Contact with the molten forms of the chemical may cause severe burns to the skin and eyes (HSDB, 2000b).

The clinical signs and symptoms after ingestion of soluble fluoride salts occur in the following five stages: (I) salty or soapy taste, salivation, nausea, abdominal pain, vomiting, (bloody) diarrhea, dehydration, and thirst; (II) muscle weakness, tremors, and in rare instances transient epileptiform convulsions, which may lead to central nervous depression; (III) shock characterized by pallor, weak and thready pulse, shortness of breath, weak heart sounds, wet and cold skin, cyanosis, dilated pupils, followed by death in two to four hours; (IV) when death has not occurred, paralysis of muscle deglutition, carpopedal spasm, and spasm of extremities; and (V) occasionally localized or generalized urticaria. A probable oral lethal dose of 50-500 mg/kg, classified as very toxic, has been reported for a 150-pound (70-kg) person receiving between 1 teaspoon and 1 ounce of the chemical (Gosselin et al., 1976; cited by HSDB, 2000b).

A girl (2.5 years old) who ingested sodium hexafluorosilicate "developed acute respiratory failure, a prolonged AT interval, ventricular tachycardia and fibrillation, hypokalemia, hypocalcemia (3 to 4 mg/100 mL), and aspiration pneumonia" (Ellenhorn et al., 1997; cited by HSDB, 2000b). In a suicide attempt, a female chemical plant worker (32 years old) who ingested three teaspoons of sodium hexafluorosilicate immediately began vomiting, and then experienced facial numbness, diarrhea, diaphoresis, muscle spasms, weakness, abdominal pain, dyspnea, shallow breathing, and cramps of the palms, feet, and legs. Tachycardia and tachypnea were observed. After 12 hours, generalized weakness and enlargement of the liver continued. Treatment with calcium compounds (calcium carbonate initially; calcium lactogluconate for ten days after life-threatening symptoms had diminished) resulted in recovery within 21 days (Dadej et al., 1987).

Fluorosilicic Acid

Contact with the molten forms of fluorosilicic acid may cause severe burns to the skin and eyes. It is also extremely corrosive to the respiratory tract (Hawley, 1981; cited by HSDB, 2000a). The symptoms of inhalation include burning of the eyes and numbness around the lips. Symptoms do not necessarily occur immediately; they can appear 24 hours after exposure.

On the morning of September 6, 1994, a tanker truck spilling 4500 gallons of fluorosilicic acid on Interstate 4 near Deltona, Florida, covering an area 600 feet long and 60 feet wide, resulted in the evacuation of approximately 2300 people from their homes into shelters. Later in the day, fumes were detected in the Deltona Woods neighborhood; because the acid could be carried by the wind, everyone within a mile radius was evacuated, which included 1,750 people in Orange County and 500 people in Deltona. More than 50 people went to hospitals, complaining of skin and respiratory irritation, including burning in the throat, and headaches. An individual riding in a truck with his arm out the window experienced burning on his forearm (Lancaster, 1994).

The effects of long-term exposure to fluorosilicic acid are changes in bone, corrosivity of the mucous membranes (e.g., ulceration of the nose, throat, and bronchial tubes), coughing, shock, pulmonary edema, fluorosis, coma, and even death (LCI, Ltd., undated-a). In a study of 50 workers engaged for approximately 30 years in the production of phosphate fertilizers, the concentration of gaseous fluoride (hydrogen fluoride, silicon tetrafluoride, and fluorosilicic acid) ranged from 0.04 to 0.17 mg/m^3. Nine workers had increased bone densities (Fabbri et al., 1978; cited by HSDB, 2000a).

When swallowed, severe irritation of the lungs, nose, and throat can occur, as well as severe damage to the throat and stomach (LCI, Ltd., undated-a). A probable oral lethal dose of 50-5000 mg/kg, classified as very toxic, has been reported for doses between 1 teaspoon and 1 ounce for a 150-pound (70-kg) person; a probable oral lethal dose of 5-50 mg/kg, classified as extremely toxic, has been reported for doses between 7 drops and 1 teaspoon for the same individual (Gosselin et al., 1984; cited by HSDB, 2000a).

9.1.2 Chemical Disposition, Metabolism, and Toxicokinetics

In a female chemical plant worker who ingested sodium hexafluorosilicate (see Section 9.1.1), fluoride levels in serum and urine (fresh) were 5.130 and 235.60 mg/dm^3, respectively, on day 2 of hospitalization. Treatment with calcium compounds (calcium carbonate and calcium lactogluconate) immediately returned levels to normal. The following day, the levels dropped to 0.399 and 15.39 mg/dm^3, respectively; by day 20, the levels were 0.067 and 0.87 mg/dm^3, respectively (Dadej et al., 1987).

In 50 workers engaged for approximately 30 years in the production of phosphate fertilizers and exposed to gaseous fluoride (hydrogen fluoride, silicon tetrafluoride, and fluorosilicic acid), urine fluoride excretion ranged from 1.0 to 9.6 mg F^-/L (controls: 0.3 to 1.2) (Fabbri et al., 1978; cited by HSDB, 2000a).

In rats fed a diet containing 0.16% sodium hexafluorosilicate supplemented in a corn-soybean oilmeal-casein ration *ad libitum* for 22-23 days, the average amounts of fluorine were 94.4 mg in feces and 91.9 mg in urine. The mean amount of fluorine absorbed was 65.1% and that retained was 31.0% (Kick et al., 1935).

From 1965 to 1974, 170 cases of suspected fluorosilicate poisoning were reported in domestic animals. For positive cases, the animals were poisoned from ingestion of bait, which had not been disposed of after use. Of these, 27 cases were used in the chemical diagnosis of sodium hexafluorosilicate poisoning (13 for cattle, 11 for sheep, and 1 each for horse, pigeon, and concentrate for sheep) (see also Section 9.1.3). In cattle and sheep, measured fluorine

concentrations ranged from 120 to 2900 ppm (wet weight) in stomach/rumen contents and up to 75 ppm in urine. In blood serum, 8 and 3 ppm fluorine were determined in one animal from the groups of poisoned cattle and sheep, respectively (Egyed and Shlosberg, 1975).

When sheep were given sodium hexafluorosilicate via stomach tube (25, 50, 200, 1500, and 2000 mg/kg; 0.13, 0.27, 1.06, 7.976, and 10.63 mmol/kg), blood serum concentrations and urine levels of fluoride initially significantly increased and then decreased with time. For example, the low-dose group had blood serum concentrations ranging from 0.1-0.165 ppm fluoride prior to treatment and 4.2 ppm fluoride six hours after dose administration. By day 4, levels dropped to 0.38 ppm fluoride. Corresponding urine levels of fluoride were 1.35-6.75, 175, and 25 ppm, respectively (Egyed and Shlosberg, 1975).

9.1.3 Acute Exposure

Acute toxicity values for sodium hexafluorosilicate and fluorosilicic acid are presented in **Table 1**. The details of selected studies discussed in this section are presented in **Table 2**.

Table 1. Acute Toxicity Values for Sodium Hexafluorosilicate and Fluorosilicic Acid

Route	Species (sex and strain)	$LC_{Lo}/LD_{50}/LD_{Lo}/TD_{Lo}$	Reference(s)
Sodium hexafluorosilicate			
oral	mouse (sex and strain n.p.)	LD_{50} = 70 mg/kg; 0.37 mmol/kg	RTECS (1997)
	rat (sex and strain n.p.)	LD_{50} = 125 mg/kg; 0.665 mmol/kg	HSDB (2000b)
	rat (F, Sprague-Dawley albino white)	LD_{50} = 430 mg/kg; 2.29 mmol/kg	Rhone-Poulenc Inc. (1971)
	rat (sex and strain n.p.)	TD_{Lo} = 248 mg/kg; 1.32 mmol/kg	RTECS (1997)
	rabbit (sex and strain n.p.)	LD_{50} = 125 mg/kg; 0.665 mmol/kg	
s.c.	rat (sex and strain n.p.)	LD_{Lo} = 70 mg/kg; 0.37 mmol/kg	
inh	guinea pig (sex and strain n.p.)	LC_{Lo} = 33 mg/kg; 0.18 mmol/kg	Patty (1963; cited by HSDB, 2000b)
Fluorosilicic acid			
oral	guinea pig (sex and strain n.p.)	LD_{50} = 200 mg/kg; 1.39 mmol/kg	LCI, Ltd. (undated-a)

Abbreviations: F = female(s); inh = inhalation; LC_{Lo} = lethal concentration low; LD_{50} = lethal dose for 50% of test animals; LD_{Lo} = lethal dose low; n.p. = not provided; s.c. = subcutaneous(ly); TD_{Lo} = toxic dose low

Sodium Hexafluorosilicate

Mice orally given sodium hexafluorosilicate (70 mg/kg; 0.37 mmol/kg) exhibited toxic effects in the peripheral nerves, sensation, and in behavior. In rats, an oral dose (248 mg/kg; 1.32 mmol/kg) administered intermittently for one month produced toxic effects in the kidney, ureter, and/or bladder, as well as musculoskeletal and biochemical effects (RTECS, 1997). Using guinea pigs, inhalation experiments (13-55 mg/m^3 [1.7-7.2 ppm] sodium hexafluorosilicate in air for ≥6 hours) resulted in pulmonary irritation; the lowest concentration that caused death was 33 mg/m^3 (4.3 ppm) (Patty, 1963; cited by HSDB, 2000b).

Table 2. Acute Exposure to Sodium Hexafluorosilicate and Fluorosilicic Acid

Species, Strain, and Age, Number, and Sex of Animals	Chemical Form and Purity	Route, Dose, Duration, and Observation Period	Results/Comments	Reference
Sodium hexafluorosilicate				
Mouse strain, age, number, and sex n.p.	sodium hexafluoro-silicate, purity n.p.	oral; 70 mg/kg (LD_{50}; 0.37 mmol/kg); duration and observation period n.p.	Toxic effects were observed in the peripheral nerves and sensation (flaccid paralysis without anesthesia, generally neuromuscular blockage) and in behavior (ataxia and muscle contraction or spasticity).	RTECS* (1997)
Rats, strain, age, number, and sex n.p.	sodium hexafluoro-silicate, purity n.p.	oral; 248 mg/kg (1.32 mmol/kg) for 30 days intermittent; observation period n.p.	Toxic effects in the kidney, ureter, and/or bladder (other changes in urine composition) were observed. Musculoskeletal (other changes) and biochemical (enzyme inhibition, induction, or changes in blood or tissue [phosphatases] levels) effects were seen.	RTECS* (1997)
Rats, strain, age, number, and sex n.p.	sodium hexafluoro-silicate, purity n.p.	s.c.; 70 mg/kg (LD_{Lo}; 0.37 mmol/kg); duration and observation period n.p.	Fatty liver degeneration and other changes in the liver and toxic effects in the kidney, ureter, and bladder primarily changes in glomeruli were observed.	RTECS* (1997)
Guinea pigs, strain, age, number, and sex n.p.	sodium silicofluoride as dust, purity n.p.	inhalation; 13-55 mg/m^3 (1.2-7.2 ppm) in air for ≥6 h; observation period n.p.	Pulmonary irritation was observed. The lowest concentration that caused death when inhaled for 6 h was 33 mg/m^3.	Patty (1963; cited by HSDB, 2000b)
Sheep, Awassi breed, 1- to 3-yr-old, 5F	technical sodium hexafluorosilicate, purity n.p.	oral (via stomach tube); 25, 50, 200, 1500, and 2000 mg/kg (0.13, 0.27, 1.06, 7.976, and 10.63 mmol/kg) suspended in water; duration and observation period n.p.	With the 25- and 50-mg/kg doses, animals exhibited grinding of teeth (an indication of pain), dullness, and mild diarrhea. At 200 mg/kg, additional symptoms were experienced and included staggering and severe diarrhea. Animals died on day 6. With the two higher doses, licking of the lips, kicking of the belly, grinding of the teeth, falling down (after 1.5 h), frothing at the mouth, congested conjunctiva, protrudation of the tongue, forced and labored breathing, fever, and increased respiration and heart rates were observed. Animals died 3 h after administration of 1500 mg/kg and 2.5 h after administration of 2000 mg/kg. Post-mortem examination showed serous pericardial fluid (few milliliters), a slightly friable liver, mild edema in the lungs, and froth in the trachea. Hemorrhages occurred on the spleen and mucosal folds of the abomasum, and a gelatinous fluid was present in the colon. For the 1500 mg/kg-dose group, the change in GOT went from 132% (of pretreatment activity) at 1.5 hours to 230% at 2.5 hours. For LDH, the change was 158% at death. The serum ICDH change increased from 168% after one hour to 984% at death.	Egyed and Shlosberg (1975)

Table 2. Acute Exposure to Sodium Hexafluorosilicate and Fluorosilicic Acid (Continued)

Species, Strain, and Age, Number, and Sex of Animals	Chemical Form and Purity	Route, Dose, Duration, and Observation Period	Results/Comments	Reference
Fluorosilicic acid				
Rats, strain, age, number, and sex n.p.	fluorosilicic acid, purity n.p.	oral; 430 mg/kg (LD_{50}; 2.98 mmol/kg); duration and observation period n.p.	Somnolence and/or general depressed activity was observed.	RTECS* (2000)
Rats, Sprague-Dawley albino, age n.p., 5F per dose level	fluorosilicic acid (~23%, neat), purity n.p.	oral (via stomach tube); single doses of 215, 464, 1000, and 2100 mg/kg (1.49, 3.22, 6.939, and 14.57 mmol/kg) dissolved in water. Animals were observed for 14 days and then necropsied.	With 464 mg/kg, 3 out of 5 rats died; at ≥1000 mg/kg, 100% mortality was observed. At ≥464 mg/kg, acute depression was observed. Necropsy showed that animals in the low-dose group were "grossly normal" and that dead rats had massive hemorrhages in the entire gastrointestinal tract.	Rhone-Poulenc Inc. (1971)
Rats, guinea pigs, and swine tested as a group; no other data were provided	fluorosilicic acid, purity n.p.	percutaneous; amounts, duration, and observation period n.p.	The intact skin was not affected. When areas were injured before application of the acid, necrosis, continuously spreading, occurred in the deeper regions. Hypocellular necrosis, consisting of sharp leukocyte demarcations, and edema up to the subcutis were observed.	Alhassan and Zink (1982; cited by HSDB, 2000a)
Rabbits, New Zealand, age n.p., 6, sex n.p.	fluorosilicic acid (~23%, neat), purity n.p.	dermal; 0.5 mL (4 mol) to the intact and abraded skin for 1, 24, or 72 h	Severe erythema and edema were observed, indicating the material to be a primary irritant.	Rhone-Poulenc Inc. (1971)
Rabbits, New Zealand, age n.p., 6, sex n.p.	fluorosilicic acid (~23%, neat), purity n.p.	instillation; 0.1 mL (0.8 mol) into the left eye. Eyes were observed at 24, 48, and 72 h following treatment.	Severe and permanent corneal opacity with scar tissue occurred.	Rhone-Poulenc Inc. (1971)

Abbreviations: GOT = glutamate oxaloacetate transaminase; h = hour(s); ICDH = isocitric dehydrogenase; LDH = lactate dehydrogenase; n.p. = not provided

*RTECS uses codes for Toxic Effects. For some codes, it is unclear whether the effects occur in all organs (e.g., M02 — KIDNEY, URETER, BLADDER [Changes primarily in glomeruli]). In these instances, "and/or" has been used.

When sodium hexafluorosilicate (500 mg; 2.66 mmol) was applied to the skin of adult rabbits, mild irritation occurred. When applied to the eyes (100 mg; 0.532 mmol), severe irritation was observed; following a four-second rinse, the effect was still severe (RTECS, 1997).

Sodium hexafluorosilicate poisoning in domestic animals from the ingestion of bait which had not been disposed of after use (13 cases for cattle, 11 for sheep, and 1 each for horse, pigeon, and concentrate for sheep) resulted in drowsiness, constipation, loss of appetite, paresis of the rumen, severe abdominal pain, and diarrhea. Sheep also exhibited grinding of the teeth (an indication of pain) and frothing at the mouth in most cases of lethal poisoning, while the horse also had bradycardia. In an acute study in which sheep were orally administered technical sodium hexafluorosilicate (25, 50, 200, 1500, and 2000 mg/kg; 0.13, 0.27, 1.06, 7.976, and 10.63 mmol/kg) via stomach tube, the animals exhibited similar symptoms. In addition, with the two highest doses, falling down (after 1.5 hours), congested conjunctiva, forced and labored breathing, fever, and increased respiration and heart rates were observed. Animals died 6 days after administration of 200 mg/kg and 2.5 hours after administration of 2000 mg/kg (Egyed and Shlosberg, 1975). When a dairy herd of 600 animals was acutely poisoned from railcar contamination of feed, 95% of the animals had decreased neuromuscular transmission. The poisoning, which resembled calcium depletion, was effectively treated with calcium gluconate intravenously (HSDB, 2000b [original source was not cited]).

Fluorosilicic Acid

In rats orally given fluorosilicic acid (430 mg/kg; 2.98 mmol/kg), somnolence and/or general depressed activity was observed (RTECS, 2000). Other rat studies with fluorosilicic acid (single oral doses of 215, 464, 1000, and 2100 mg/kg [1.49, 3.22, 6.939, and 14.57 mmol/kg]) led to its classification as "moderately toxic" (Rhone-Poulenc, Inc., 1971). Percutaneous administration of the compound (amounts not provided) in rats, guinea pigs, and pigs resulted in continuously spreading necrosis in the deeper regions of injured skin. Hypocellular necrosis, consisting of sharp leukocyte demarcations, and edema up to the subcutis were also observed (Alhassan and Zink, 1982; cited by HSDB, 2000a). In rabbits, it was corrosive to the skin (0.5 mL [4 mol] for 1, 24, or 72 hours) and eyes (0.1 mL [0.8 mol] instilled into left eye) (Rhone-Poulenc Inc., 1971).

9.1.4 Short-term and Subchronic Exposure

No data were available.

9.1.5 Chronic Exposure

No data were available.

9.1.6 Synergistic/Antagonistic Effects

Fluoride, administered in the form of sodium hexafluorosilicate, had a strong affinity for calcium and magnesium. When orally given to sheep via a stomach tube at doses of 25, 50, 200, 1500, and 2000 mg/kg, increased changes in serum calcium and magnesium levels were observed at the two highest doses within 30 minutes after dose administration. At 200 mg/kg, recovery of both levels occurred after five days. With the 1500 mg/kg dose group, changes in phosphorus and sugar levels in whole blood were also significantly increased (16% [of pretreatment levels] at 1.5 hours to 146% at 2.5 hours for phosphorus; 300% to 374%, respectively, for sugar levels) (Egyed and Shlosberg, 1975).

9.1.7 Cytotoxicity
No data were available.

9.2 Reproductive and Teratological Effects
No data were available.

9.3 Carcinogenicity
No studies with sodium hexafluorosilicate or fluorosilicic acid were available. IARC (1987) concluded that there was inadequate evidence for carcinogenicity to humans and to animals for inorganic fluorides used in drinking water.

9.4 Initiation/Promotion Studies
No data were available.

9.5 Anticarcinogenicity
No data were available.

9.6 Genotoxicity
Sodium hexafluorosilicate was negative in the Salmonella/microsome test (concentrations up to 3600 g/plate, –S9) and the micronucleus test on mouse bone marrow (37.2 mg/kg; 0.198 mmol/kg) (Gocke et al., 1981). The compound (0.25 mM; 47 g/mL) did not induce sex-linked recessive lethal mutations in *Drosophila* (Gocke et al., 1981; IARC, 1987). In the *Bacillus subtilis* rec-assay system, sodium hexafluorosilicate (0.001-10 M; 188 g/mL-1.9 g/mL) also gave negative results (Kada et al., 1980; Kanematsu et al., 1980).

9.7 Cogenotoxicity
No data were available.

9.8 Antigenotoxicity
No data were available.

9.9 Other Data
Within one week after beginning work in a foam rubber plant, a 23-year-old man exhibited skin lesions consisting of "diffuse, poorly delineated, erythematous plaques with lichenoid papules and large pustules" on his arms, wrists, thighs, and trunk. Although scratch and patch tests with sodium hexafluorosilicate (2% aqueous) were negative, animal testing showed the compound to be a pustulogen. When rabbits received topical application of a 1, 5, 10, and 25% solution of sodium hexafluorosilicate in petroleum, pustules occurred on normal skin only with the high concentration, while all concentrations produced pustules on stabbed skin (Dooms-Goossens et al., 1985).

10.0 Structure-Activity Relationships
At levels of 14-16 ppm fluorine, sodium fluoride, sodium hexafluorosilicate, and cryolite (Na_3AlF_6) had the same extent of chronic fluorine intoxication in rats (De Eds and Thomas, 1933-1934; cited by McClure, 1950). At 40 and 80 ppm, the chronic toxicity (observations on growth rate, fecundity, mortality, tooth development, pathology, and disease) of barium fluorosilicate and cryolite in rats was "substantially the same as that of sodium fluoride for the same fluorine content" (Smyth and Smyth, 1932; cited by McClure, 1950). At 14 ppm fluorine,

ammonium fluoride, potassium fluoride, barium fluorosilicate, potassium fluorosilicate, and sodium fluorosilicate exhibited the same acute toxicity as sodium fluoride in the animals (Smith and Leverton, 1934; cited by McClure, 1950).

In a comparative study of absorption and excretion of fluorine in rats fed sodium fluoride, calcium fluoride, and sodium hexafluorosilicate, the percent fluorine retained was the same for the two sodium compounds (Kick et al., 1935 [see Section 9.1.2 for details regarding sodium hexafluorosilicate]). Several experiments on growing rats orally given 5, 10, 15, 25, and 50 ppm fluorine as sodium fluoride or sodium hexafluorosilicate for 90-100 days found no differences in the quantity of fluorine deposited and the contents of ash, calcium, and phosphorus in the incisor teeth, molar teeth, mandibles, and femurs. Furthermore, there were no differences in the percent of ingested fluorine retained in the body, and a combination of sodium silicate (15 ppm silicon) with sodium fluoride (25 ppm fluorine) did not affect the amount of fluorine deposited. The growth rate was normal in all rats (McClure, 1950).

In a separate study, litters of female weanling Osborne-Mendel rats were given 50 ppm fluorine as sodium fluoride or ammonium fluorosilicate in drinking water for 99 days. The cariostatic effect was similar for the two compounds i.e., both inhibited caries to the same extent. There were no differences in the amounts of fluorine and ash deposited in the molars, incisors, mandibles, and femurs. There were no differences in growth rate and in the production of incisor striations (Zipkin and McClure, 1954).

11.0 Online Databases and Secondary References

11.1 Online Databases

Chemical Information System Files
SANSS (Structure and Nomenclature Search System)
TSCAINV (Toxic Substances Control Act Inventory)
TSCATS (Toxic Substances Control Act Test Submissions)

National Library of Medicine Databases
EMIC and EMICBACK (Environmental Mutagen Information Center)

STN International Files

AGRICOLA	EMBASE	NTIS
BIOSIS	HSDB	PROMT
CA	LIFESCI	Registry
CABA	MEDLINE	RTECS
CANCERLIT	NIOSHTIC	TOXLINE

TOXLINE includes the following subfiles:

Toxicity Bibliography	TOXBIB
International Labor Office	CIS
Hazardous Materials Technical Center	HMTC
Environmental Mutagen Information Center File	EMIC
Environmental Teratology Information Center File (continued after 1989 by DART)	ETIC
Toxicology Document and Data Depository	NTIS
Toxicological Research Projects	CRISP
NIOSHTIC¤	NIOSH
Pesticides Abstracts	PESTAB
Poisonous Plants Bibliography	PPBIB
Aneuploidy	ANEUPL
Epidemiology Information System	EPIDEM
Toxic Substances Control Act Test Submissions	TSCATS
Toxicological Aspects of Environmental Health	BIOSIS
International Pharmaceutical Abstracts	IPA
Federal Research in Progress	FEDRIP
Developmental and Reproductive Toxicology	DART

In-House Databases
CPI Electronic Publishing Federal Databases on CD
Current Contents on Diskette¤
The Merck Index, 1996, on CD-ROM

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Appendix: Units and Abbreviations

°C = degrees Celsius

µg/L = microgram(s) per liter

µg/m^3 = microgram(s) per cubic meter

µg/mL = microgram(s) per milliliter

µM = micromolar

ACGIH = American Conference of Governmental Industrial Hygienists

AOAC = Association of Official Analytical Chemists

AWWA = American Water Works Association

bw = body weight

C.P. = Commercially Pure

CSDS = Colorado Springs Dental Society

EPA = Environmental Protection Agency

F = female(s)

FIFRA = Federal Insecticide, Fungicide, and Rodenticide Act

g = gram(s)

g/mL = gram(s) per milliliter

h = hour(s)

HSDB = Hazardous Substances Data Bank

IARC = International Agency for Research on Cancer

i.p. = intraperitoneal(ly)

kg = kilogram(s)

L = liter(s)

LC_{50} = lethal concentration for 50% of test animals

LC_{Lo} = lethal concentration low

LD_{50} = lethal dose for 50% of test animals

LD_{Lo} = lethal dose low

M = male(s)

MAL = Maximum Allowable Level

MCL = Maximum Contaminant Level

MUL = maximum use level

mg/kg = milligram(s) per kilogram

mg/m^3 = milligram(s) per cubic meter

mg/mL = milligram(s) per milliliter

min = minute(s)

mL/kg = milliliter(s) per kilogram

mm = millimeter(s)

mM = millimolar

mmol = millimole(s)

mmol/kg = millimoles per kilogram

mo = month(s)

mol = mole(s)

mol. wt. = molecular weight

NICNAS = National Industrial Chemicals Notification and Assessment Scheme

NIOSH = National Institute for Occupational Safety and Health

NSF = National Sanitation Foundation

NOES = National Occupational Exposure Survey

NOHS = National Occupational Hazard Survey

n.p. = not provided

OSHA = Occupational Safety and Health Administration

PEL = permissible exposure limit

ppb = parts per billion

ppm = parts per million

p.o. = peroral(ly), *per os*

REL = relative exposure limit

RTECS = Registry of Toxic Effects of Chemical Substances

s.c. = subcutaneous(ly)

SMCL = Secondary Maximum Contaminant Level

STEL = short-term exposure limit

TD_{Lo} = toxic dose low

TLV = threshold limit value

TSCA = Toxic Substances Control Act

TWA = time-weighted average

wk = week(s)

yr = year(s)

Environmental Impacts of Fluoride

Tim Fletcher
Supervisor - Water Quality Standards Unit
Standards Development Branch
Ontario Ministry of the Environment

Presented to: City of Orillia Public Forum on Fluoridation
February 29, 2012

Ontario

What is Fluoride?

- Flourine is a chemical element (“F”)
  - A halogen – like chlorine, bromine, iodine
  - Highly reactive with other elements
  - Found as the fluoride ion (“F^-”)

- 13^{th} most abundant element in the earth’s crust

http://en.wikipedia.org/wiki/Fluorine

Ontario

Fluoride in the Environment

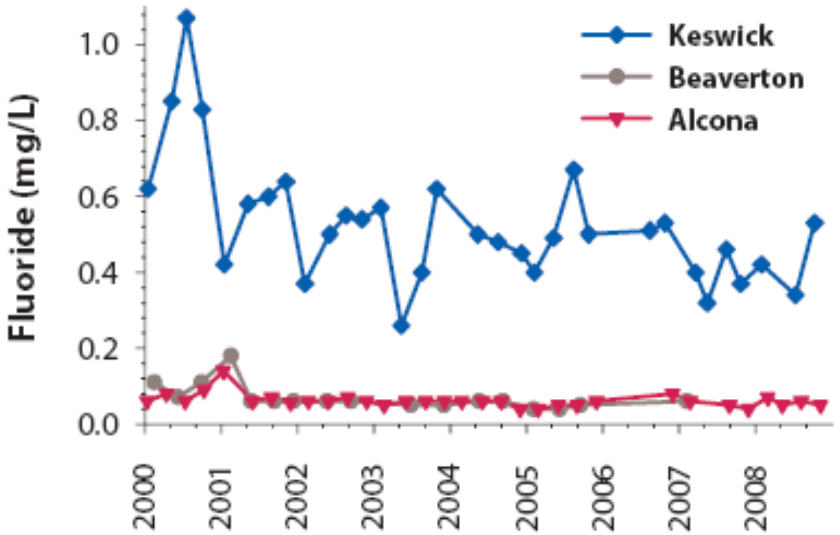
- Released into the environment in many ways
  - Weathering of rock
  - Volcanic emissions
  - Industrial emissions
    - Aluminium smelting (75% of fluoride emissions to atmosphere)
    - Steel production
    - Phosphate fertilizer production (80% of fluoride emissions to water)
    - Etc.,

- Canadian Ground waters – often 0.02 to 1.2 mg/L, but may be as high as 15 mg/L
- Canadian Surface waters – vary from 0.01 to 11.0 mg/L
- Inorganic fluoride levels in the Great Lakes range from 0.05 to 0.14 mg/L

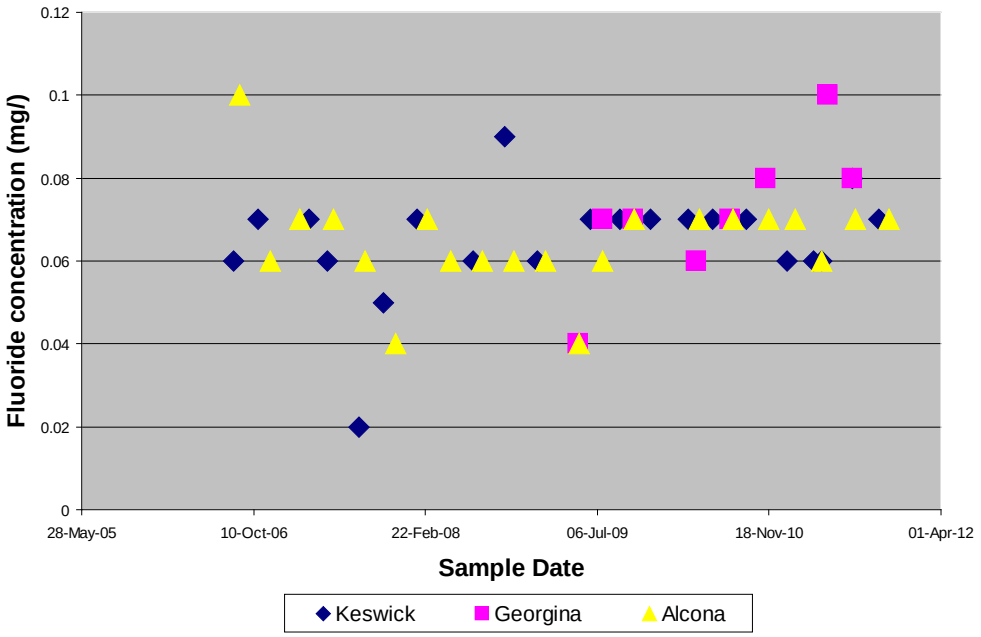
PSL Assessment Report: Inorganic Fluorides (Gov't of Canada, 1993)
Canadian Water Quality Guidelines: Inorganic Fluoride (CCME, 2002)

Fluoride in Lake Simcoe

DWSP treated drinking water



DWSP raw water (Fluoride)



Lake Simcoe Water Quality Update - May 2010 (MOE, 2011)
Drinking Water Surveillance Program (MOE, accessed 02/2012)

Ontario

Water Quality Criteria for Protection of Aquatic Life

- National (Canadian Water Quality Guidelines; CWQGs) or Provincial (Water Quality Objectives; PWQOs)
- Represent a satisfactory level for surface waters
- Protective of all forms of aquatic life, all life stages, indefinite exposure periods
- Based on current, scientifically defensible toxicological data
- Not regulatory values
- Used for;
  - Assessing ambient conditions and identify areas with existing or potential water quality problems
  - As a starting point for regulatory instruments (e.g. Certificates of Approval)
  - To help assess the aquatic environmental significance of discharges (controlled or uncontrolled) and remedial actions
  - To support government policy

CWQG for Fluoride

- The *interim* Canadian Water Quality Guideline for Fluoride in freshwaters is 0.12 mg/L
- Derived using the lowest acceptable adverse effect level reported:
  - a 144-h LC50 value of 11.5 mg F/L for the caddisfly *H. bronta*
  - Uses a 100 fold safety factor as the study was short in duration (acute) and fluoride is considered a persistent substance (an element)

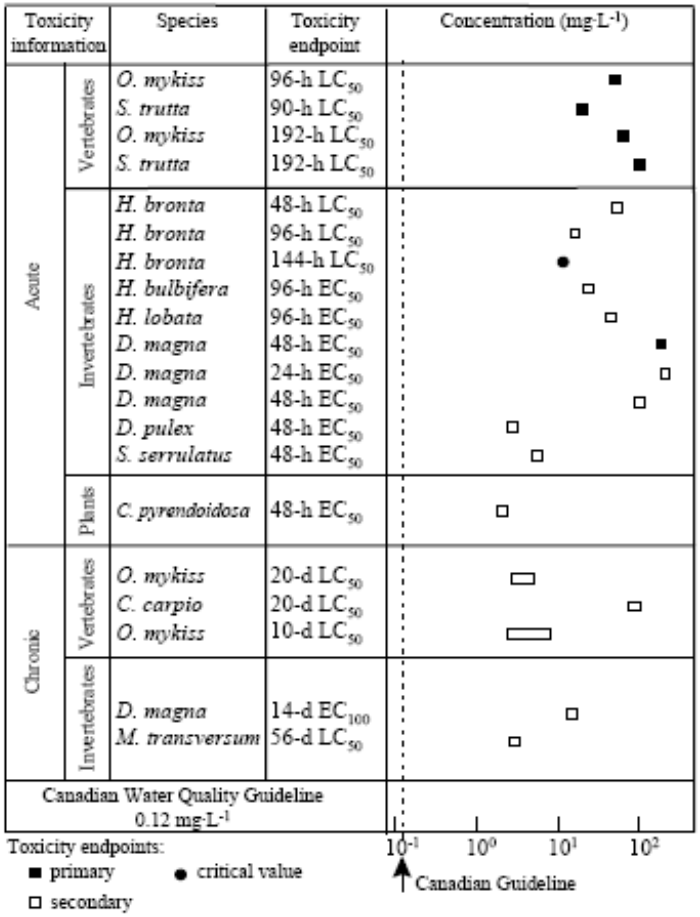
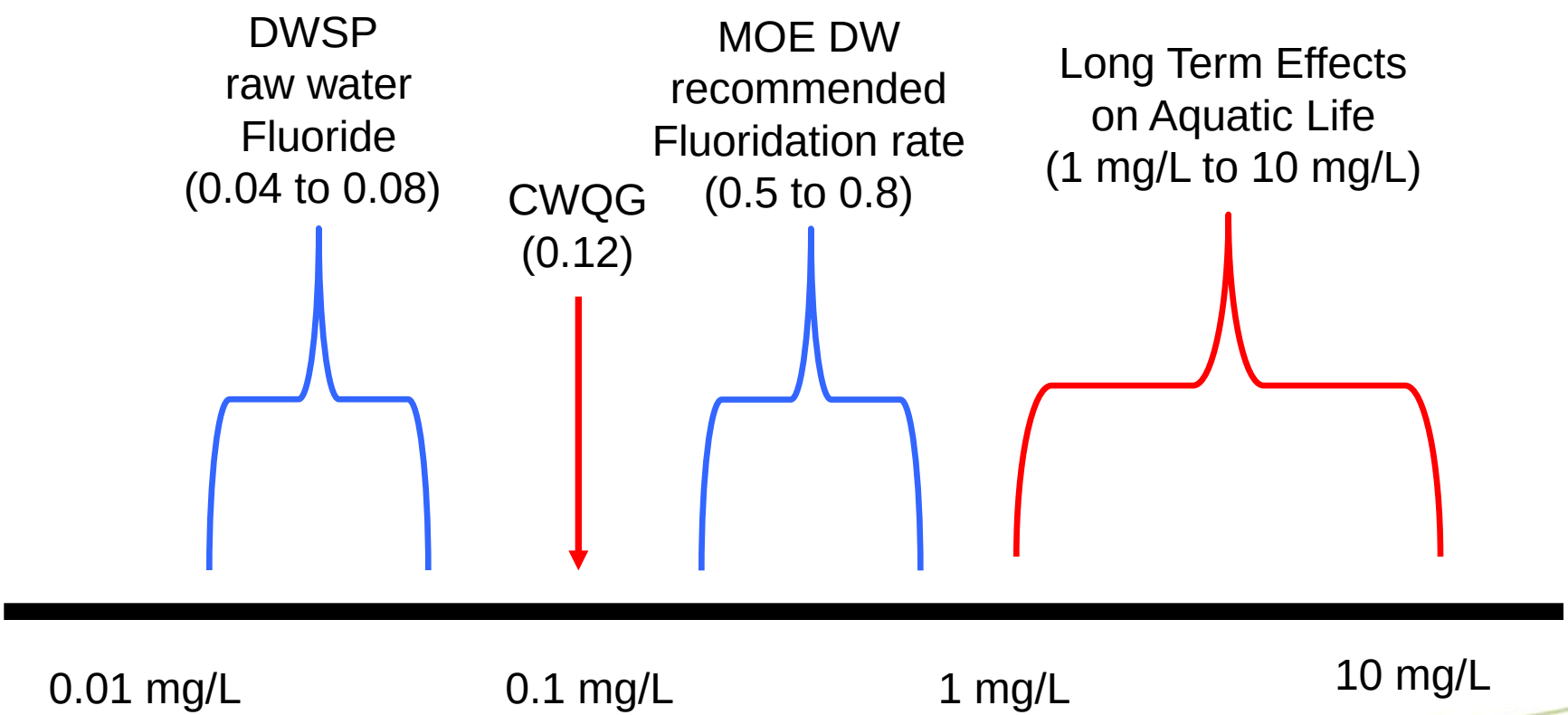


Figure 1. Select freshwater toxicity data for inorganic fluorides.

Ontario

Drinking Water Concentrations compared to Aquatic Life Effects



Ontario

Conclusions

- Fluoride concentrations are not decreased significantly through the sewage treatment process, thus levels in municipal wastewater effluent would be similar to the levels added (i.e. 0.5 to 0.8 mg/L).
- Impacts to aquatic life (i.e. changes in growth, reproduction or survival) are unlikely to occur until concentrations exceed 1 mg/L for extended periods of time.
- Fluoridated drinking water is well below this concentration and would not be expected to impact aquatic life.
- A review of the fluoride data from 1986 to 2007 has shown no increasing trend in raw (source) water for the 192 drinking water systems that have been monitored by DWSP.
- Data also shows that, on average, concentrations in Great Lakes drinking water intakes are at or below the CWQG for inorganic fluoride.

From: Henry Wilson [mailto:henrykwilson6@yahoo.ca]
Sent: Wednesday, February 22, 2012 8:43 PM
To: JASON COVEY
Cc: henrykwilson6@yahoo.ca
Subject: The Advantages of a Fluorided Water Supply

Introduction: the dubious honour of being the oldest practicing dentist in Orillia-
my birthday-so young and youthful looking
waited 42 years for tonight
Time to bring Mariposa into the 21st century

Dentistry is prevention oriented- flossing, sealants, regular preventive visits- trying to work ourselves out of a job? Fluoride is prevention!

Gordon Sinclair-1962-Toronto gets fluoride in water inspite of his rants about "rat poison"
Intellectual honesty- Sinclair complains on his radio station about being stopped for speeding in Gravenhurst- OPP should concentrate on catching criminals and leave wealthy cottagers in their Rolls Royces alone!!!

In 1962 vote the suburbs with families and children carried the vote for fluoride-

Central Toronto didn't realize that fluoride reduces root caries and edentulusness in older people or maybe they would have voted for it. Fluoride is not just for helping young people.

Fluoride in water supply is not "rocket science" or "cutting edge technology". The jury is not still out. It returned a "not guilty verdict" years ago.

We put chlorine in our drinking water and iodine in our salt.

Stephen Leacock would be chuckling- "Sunshine Sketches of a Little Town" revisited-

Fluoridation in water is supported by 90 reputable medical and dental organizations including:
-World Health Organization
-Centre For Disease Control and Prevention
-Health Canada
-Canadian Medical, Dental and Pediatric Associations

Conclusions as to the efficacy and safety of products and materials should come from respected institutions, involving scientists using double blind studies and peer reviewed articles not from anecdotal experiences or articles in the National Enquirer!!!

Return on Investment:- for every dollar spent on fluoride for the water supply you save $38. on dentistry.

Fluorosis occurs mainly from swallowing fluoride toothpaste instead of spitting it out. If poor compliance, use toothpaste without fluoride.

If truly concerned that increasing fluoride content in the water by 0.5 ppmillion, then drink bottled or spring water.

Trudeau mentioned a lot about "rights" and not enough about responsibilities. Teenage single mothers in Orillia is 2 times that of Toronto per capita and 11/2 times that of Barrie.

The lower income and disadvantaged need our help.

As a locum dentist for the past 12 years, I have worked in numerous other communities and have seen first hand the benefits of fluoride in the water supply.

Is the meaning of life and our purpose on earth "to do good" ??

If politicians could act "to provide the greatest good to the largest number of citizens preferably at the lowest cost", this would be a very worthwhile aim.

A fluoridated water supply is "justifiable" on this basis.

- Aging yuppie and an OPP officer-

APPENDIX E

SIMCOE MUSKOKA DISTRICT HEALTH UNIT INFORMATION KIT

simcoe muskoka
DISTRICT HEALTH UNIT

Fluoride Facts

Community Water Fluoridation

Begin a legacy of healthy teeth

Community water fluoridation (CWF) is when a municipality adjusts the fluoride content of drinking water to a level that helps prevent tooth decay. Community water fluoridation is proven to be a safe and effective way to reduce dental cavities for the population. The health benefits of community water fluoridation are felt by everyone, regardless of a person's age, income level or access to routine dental care. About 77% of Ontarians benefit from drinking fluoridated water through their municipal water system.

Why add fluoride to Orillia's drinking water?

- Just a tiny amount of fluoride in drinking water helps to harden tooth enamel in primary and permanent teeth, making them more resistant to decay.
- Tooth decay can lead to many issues such as difficulty with eating, increased pain, trouble concentrating and decreased self esteem and social interaction.
- Drinking fluoridated water reduces tooth decay by 20% to 40% (CDC, 2005) even when other sources of fluoride (e.g. toothpaste, topical fluorides given by a dentist) are used.
- Orillia has never had community water fluoridation. Among the 10 largest communities in Simcoe Muskoka, elementary school children in Orillia have the most severely decayed teeth (SMDHU screening data, 2010-2011). This represents a 66% higher decay rate than elementary school children in fluoridated areas of Simcoe Muskoka.

Fluoride exists in water naturally

- Fluoride is a common mineral found in rocks, soil and water, but it generally appears in water in amounts too low to protect teeth. The natural fluoride concentration in the City of Orillia's water is 0.2 mg/L. The optimal concentration for dental health is 0.7 mg/L as determined by Health Canada.
- Fluoride can be delivered in various ways – as an additive to water or salt; or directly to teeth through a fluoride dental application and dental products (like toothpaste, rinse or varnish applied by a dentist).

Safety of community water fluoridation

- The safety of community drinking water is taken very seriously by the provincial and municipal governments and the Simcoe Muskoka District Health Unit. Levels of fluoride added to water are safe and are carefully monitored.
- A very small amount of fluoride is added to municipal water. Optimal fluoride concentration is between 0.5 to 0.8 parts per million (Ontario Ministry of the Environment, Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, 2003). One part per million is comparable to one minute in two years, or one cent in $10,000.
- The only proven risk from community water fluoridation is mild dental fluorosis. Fluorosis is a discoloration of the teeth that in its mild form appears as pale white lines across the teeth. The risk of dental fluorosis is very low at the recommended levels for water fluoridation.

over…

- Swallowing toothpaste is the most common way that small children get too much fluoride.
- Studies have found that water fluoridation is safe for the environment and poses no risk to plants and animals.
- Fluoridation is endorsed as safe and effective by Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association, the Canadian Public Health Association and Ontario's Chief Medical Officer of Health, among others.

Evidence on the effectiveness and safety of water fluoridation

- The safety and effectiveness of water fluoridation have been proven through numerous studies and several large systematic reviews of research, including the following:
  - Findings and Recommendations of the Fluoride Expert Panel Health Canada, January 2007.
  - A Systematic Review of the Efficacy and Safety of Fluoridation. National Health and Medical Research Council, Australian Government, 2007.
  - Oral Health in America: A Report of the Surgeon General, 2000.
  - Systematic Review of Water Fluoridation. UK/International study, 2000.
- The weight of evidence does **NOT** support a link between drinking fluoridated water and increased risks of the following conditions: cancer, skeletal fluorosis (brittle bones), adverse effects among people with kidney problems, lowering of Intelligence Quotient (IQ), bone fracture, immunotoxicity, reproductive and developmental toxicity, DNA toxicity and neurotoxicity.

What is at stake?

- A recent study showed that there are more hospital emergency department visits in Ontario for non-traumatic dental problems than for diabetes and hypertensive diseases combined. (Community Dentistry and Oral Epidemiology, August 2009). This is also true for Orillia Soldiers Memorial Hospital (National Ambulatory Care Reporting System 2005-09).
- Dental cavities are one of the most prevalent chronic diseases in childhood (Centers for Disease Control).
- Every $1 invested in community water fluoridation yields about $38 in savings each year from fewer cavities treated (*J Publ Health Dent* 2001;61(2):78–86).
- On average in Simcoe Muskoka, the provincial-municipal cost-shared CINOT (Children in Need of Treatment) dental program spends $14 (3%) less to treat a child who lives in a fluoridated area than on a child who lives in a non-fluoridated area. The cost-shared dental treatment provided under Ontario Works spends $70 (19%) less on treatment for a child who lives in a fluoridated area than one who lives in a non-fluoridated area (Simcoe Muskoka CINOT data, 2006-08).

More information

To learn more about community water fluoridation and its health benefits, visit the health unit's website at www.simcoemuskokahealth.org or call Your Health Connection at 1-877-721-7520.

simcoe muskoka
DISTRICT HEALTH UNIT

Fluoride Action Sheet for Organizations

Take Action:

Supporting Community Water Fluoridation in Orillia

Community water fluoridation (CWF) is a safe and effective way to reduce dental cavities for the people in our community. The dental health benefits of community water fluoridation are felt by everyone, regardless of a person's age, income level or access to routine dental care.

Orillia City Council will consider the implementation of CWF at its June 2012 meeting after public consultations have taken place in early 2012. The Simcoe Muskoka District Health Unit encourages you and/or your organization to voice support for community water fluoridation in Orillia in order to improve the dental health of all residents. You can do this in the following ways:

- ☐ Send a letter of support to Orillia Council voicing your individual and/or organizational endorsement of CWF.

Adapt one of the sample letters included in this Info Kit to draft your letter of support and mail it to:.

- City of Orillia Clerk's Department, 50 Andrew Street South, Suite 300, Orillia, ON L3V 7T5, or email it to: clerks@orillia.ca.
- The health unit would appreciate receiving a copy of organizational letters. Please send it to: Simcoe Muskoka District Health Unit, 15 Sperling Drive, Barrie, ON L4M 6K9, or email it to: cwf@smdhu.org.
- Send a letter of support as a resident to your ward councilor.

- ☐ Send a letter to the editor of local newspapers voicing your individual and/or organizational support for CWF.

Adapt the sample letter included in this Info Kit and mail it to:

- The Orillia Packet and Times - 425 West Street North, Orillia ON L3V 7R2 or: newsroom@orilliapacket.com.
- Orillia Today - 25 Ontario Street, Orillia, ON L3V 6H1 or: fmatys@simcoe.com.

- ☐ Attend the City's first public meeting about fluoridation on February 29, 2012, 6:30-9:30 p.m. in the Council Chamber at Orillia City Hall to voice your or your organization's support for CWF. You can pre-register to be a presenter at the meeting. Details are available on the City of Orillia website at: www.orillia.ca/en/livinginorillia/haveyoursay.asp.
- ☐ Attend the City's second public meeting on May 29, 2012 (same time and location as above), to hear the final report and recommendations that will go forward to Council in June.
- ☐ Raise awareness about the dental health benefits of CWF with your clients/patients. Provide them with a copy of the Fluoride Fact Sheet and/or Q&A's included in this Info Kit, or put them in your waiting area as reading information. If you would like more copies you can download and print them from our website, or contact Your Health Connection at 1-877-721-7520 to order more.
- ☐ Talk to your staff, colleagues, peers, family and friends about CWF and ask them to voice their support for this important initiative.

For more information

For information about CWF, visit the health unit's website at www.simcoemuskokahealth.org or call Your Health Connection at 1-877-721-7520.

For more details about the City of Orillia's public consultation on CWF, visit the City's website at www.orillia.ca/en/livinginorillia/haveyoursay.asp.

SAMPLE ARTICLE FOR YOUR ORGANIZATION'S NEWSLETTER ABOUT COMMUNITY WATER FLUORIDATION

The City of Orillia has asked for the Simcoe Muskoka District Health Unit's help as it works through a public consultation process to decide whether or not to bring fluoridation to the city's water supply. Public consultations begin on the evening of February 2012, with a vote by City Council scheduled to take place in June 2012.

The Simcoe Muskoka District Health Unit endorses community water fluoridation for many reasons, key among them:

- People in areas with less than optimal levels of fluoride in drinking water regularly show poorer dental health than in comparable areas where it has been in use.
- Water fluoridation reduces tooth decay by 20 to 40 per cent.
- Tooth decay, if untreated, can lead to lifelong risks to both physical and mental health.
- Fluoridated water reaches all members of a community, regardless of age, financial status or level of education, whereas proper regular dental care is not affordable to all.
- The results of systematic scientific reviews have shown no health concerns associated with optimally fluoridated water. Mild dental fluorosis (non-cosmetically apparent white streaks on teeth) is the only associated condition.

To learn about the public consultation process, visit the City of Orillia website at http://www.orillia.ca/en/livinginorillia/haveyoursay.asp. To learn about the dental health benefits of community water fluoridation, visit the health unit's website at www.simcoemuskokahealth.org.

Some Pointers On A Letter Of Support For Community Water Fluoridation

[for community partners]

Letters to City Council can be mailed, emailed or faxed and must be received by March 30, 2012. The formatting below is a suggested means of presenting your letter. We also offer a few pointers to help get your organization's letter created. Letters do not need to be long. Just a few minutes composing this letter should be enough!

City of Orillia Clerk's Department
50 Andrew Street South, Suite 300
Orillia, ON L3V 7T5
clerks@orillia.ca
fax: 705 325-5178

Dear Mayor Orsi and Council,
Re: public consultations on community water fluoridation in Orillia.

1. *Get to the point quickly: State your organization's support for City Council's implementation of community water fluoridation.*
2. *State why you support fluoridation: Can you describe the demographic profile of your clients and how they may benefit from fluoridated drinking water? What benefits do you foresee for the community? If you have colleagues who work in communities with fluoridated water you may be able to offer comparisons. Your organization's experience is valuable.*
3. *Optional – offer political/economic observations: If you have considered it, outline the cost-benefits of fluoridation from your organization's perspective. In your view over the long term, could fluoridation in Orillia reduce the burden on publicly funded social services; produce a healthier workforce; be a draw for new residents or businesses?*
4. *Conclude with a few words about the outcome: Express how you think Council's decision will affect the city, or how this event will be seen in the future. And as a courtesy, thank Council for allowing your input.*

Sincerely,

INSERT ORGANIZATION NAME HERE
lead spokesperson's name
address
phone number
email (optional)

- The health unit would appreciate receiving a copy of your letter. Please send it to: Simcoe Muskoka District Health Unit, 15 Sperling Drive, Barrie, Ontario L4M 6K9, or email it to: cwf@smdhu.org.

IDEAS FOR A LETTER TO THE EDITOR
IN SUPPORT OF COMMUNITY WATER FLUORIDATION

[*The text here is designed to get you started on creating your own letter to the editor in support of fluoridation. Editors prefer original content over repeated messages, so please use your own words.*]

The Editor,
Orillia Packet & Times / Orillia Today

In February, Orillia City Council will seek guidance from the public on a proposal to implement fluoridation in the city's municipal water supply. When this comes to a decision in June it is my/our hope that fluoridation becomes a reality.

A few points to consider for inclusion in your letter:

- Share personal experience that tooth decay is not pleasant, and can be disruptive and lead to or aggravate existing health conditions. Fluoridation is a daily measure to prevent tooth decay that doesn't need to be scheduled into a day.
- Put another way: A recent study showed there are more ER visits for non-traumatic dental problems than for diabetes and high blood pressure diseases combined (source: Community Dentistry and Oral Epidemiology, August 2009). This is also true for Orillia Soldiers' Memorial Hospital (source: National Ambulatory Care Reporting System 2005-09)**.**
- Fluoride works by strengthening the enamel of the teeth when ingested at the concentrations recommended by health experts.
- The U.S. Centers for Disease Control declared community water fluoridation one of the top 10 public health achievements of the 20th century.
- As a taxpayer you may appreciate that the cost of fluoridation would amount to less than a dollar per person per year … while helping to reduce the tax burden of paying for urgent dental care for low-income households which is significantly higher.
- An independent public opinion survey conducted in 2009 showed support for CWF in Orillia was over 60%.
- Without community water fluoridation, Orillia's children have poorer dental health than those in comparable communities where there is fluoride. For young children pain from cavities can affect their eating, their growth and development, their social lives and their educations – setbacks that can last them a lifetime.

Apart from Tottenham and Base Borden, there are no fluoridated municipal water supplies in Simcoe County or in the cities of Barrie and Orillia. However over 50% of the citizens of Muskoka, and over 70% of Ontarians have fewer cavities due to community water fluoridation. Orillia would be showing great leadership to the rest of the region by bringing water fluoridation to its residents.

Sincerely,
[Community Partner]

Mail your letter to:

- The Orillia Packet and Times, 425 West Street North, Orillia ON L3V 7R2 or email it to: newsroom@orilliapacket.com
- Orillia Today, 25 Ontario Street, Orillia, ON L3V 6H1 or email it to: fmatys@simcoe.com
- The health unit would appreciate receiving a copy of your letter. Please send it to: Simcoe Muskoka District Health Unit, 15 Sperling Drive, Barrie, Ontario L4M 6K9, or email it to: cwf@smdhu.org.

January 2012 (printed on coloured letterhead)

Dear Community Partner,

The City of Orillia is considering implementing community water fluoridation (CWF) in 2012. As part of its decision-making process, City Council instructed the Public Works Department, in conjunction with the Simcoe Muskoka District Health Unit, to conduct a public consultation process on this issue. On February 29, 2012, the City will hold an information-gathering public meeting where residents and interested individuals can present their opinions about CWF. The public is also able to provide its comments at any time via email, mail and telephone during this process. On May 29, a second public meeting will be held at which Public Works will present the report and recommendation(s) that will go forward to Council for a decision in June.

In preparation for the public consultation period and for Council's decision in June, the health unit is working with its partners to educate the community about CWF and to raise awareness of the dental health benefits of fluoridation.

Community water fluoridation is proven as a safe and effective method of preventing tooth decay for the population. It is recognized as one of the 10 great public health achievements of all times and is endorsed by organizations such as Health Canada, the World Health Organization, the Canadian Medical Association, the Canadian Dental Association and the Canadian Public Health Association. Locally, CWF is supported by the Board of Directors, the Department of Family Medicine, the Department of Paediatric and Neonatal Medicine and the Medical Advisory Committee at Orillia's Soldiers' Memorial Hospital, as well as the Leadership Council of the North Simcoe Muskoka LHIN.

People living in areas with CWF have rates of tooth decay that are 20 to 40 per cent lower than those who do not have this benefit.[1] The cavity reduction benefits of CWF go beyond other good oral health behaviours such as brushing with fluoridated toothpaste and topical application of fluoride. Community Water Fluoridation benefits all ages across all income levels, especially protecting the oral health of those who lack the means to pursue adequate dental care.

The benefits of CWF are seen clearly across Simcoe Muskoka. When comparing the 10 largest communities in Simcoe Muskoka, children in **all** eight of the communities with non-fluoridated water have worse teeth than the two communities with fluoridated water. Orillia children have the highest rates of decayed, missing, extracted or filled teeth (see Figure 1).

Despite fluoride's excellent track record, a small but very vocal and persistent minority raises a wide range of unsubstantiated health and ethical concerns about CWF. Their concerns are refuted by systematic scientific reviews which have examined alleged outcomes regarding health and safety, and links to diseases, including cancer, skeletal fluorosis, intelligence quotient (IQ), immunotoxicity, reproductive and developmental toxicity, DNA toxicity and neurotoxicity. No conclusive evidence has been found that community water fluoridation causes any of these conditions.[2-16] The only proven risk from community water fluoridation is mild dental fluorosis. Fluorosis is a discoloration of the teeth that in its mild form appears as pale white lines across the teeth. The risk of dental fluorosis is very low at the recommended levels for water fluoridation.

As Medical Office of Health for Simcoe Muskoka District Health Unit, I encourage you to show your support for community water fluoridation to help ensure its successful implementation in Orillia in June. There are a number of ways to do this, all of which are outlined in further detail in the enclosed document, "Taking Action: Supporting Community Water Fluoridation in Orillia".

This information kit also includes the following tools and information:

- CWF Fact Sheet – to place in your reception area.
- CWF Q&As (produced by the Canadian Dental Hygienists Association) – to place in your reception area.
- Letter of Support templates – to adapt and send to Orillia City Council.
- Letter to the Editor template – to adapt and send to newspapers in Orillia.
- Sample newsletter article – to insert in your organization's newsletter (if you have one).
- Focus on HealthSTATS: Oral Health in Simcoe Muskoka – to place in your reception area.
- Simcoe Muskoka District Health Unit Board of Health Position Statement on Municipal Water Fluoridation – for your information.

More information about community water fluoridation is available on our website at www.simcoemuskokahealth.org or by calling Your Health Connection at 1-877-721-7520. For details about the City of Orillia's public consultation process on CWF, visit the City's website at www.orillia.ca. If you would like to contact us about further support for CWF in Orillia, please email us at cwf@smdhu.org.

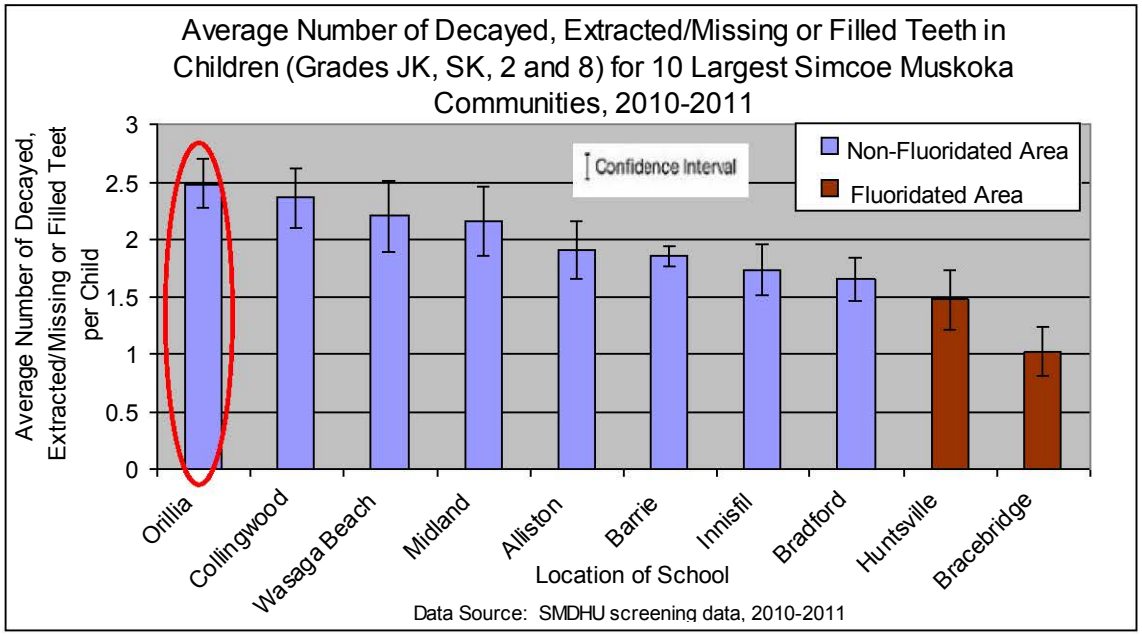
I thank you in advance for any assistance you can provide as an individual or as an organization in supporting community water fluoridation in Orillia, and for informing the residents of Orillia about the dental health benefits of this initiative.

Sincerely,

ORIGINAL SIGNED BY

Charles Gardner, MD, CCFP, MHSc, FRCPC
Medical Officer of Health

Figure 1


Average Number of Decayed, Extracted/Missing or Filled Teeth in Children (Grades JK, SK, 2 and 8) for 10 Largest Simcoe Muskoka Communities, 2010-2011
Average Number of Decayed, Extracted/Missing or Filled Teet per Child
3
2.5
2
1.5
1
0.5
0
Confidence Interval
Non-Fluoridated Area
Fluoridated Area
Orillia
Collingwood
Wasaga Beach
Midland
Alliston
Barrie
Innisfil
Bradford
Huntsville
Bracebridge
Location of School
Data Source: SMDHU screening data, 2010-2011

References

[1] American Dental Association. Statement commemorating the 60th anniversary of community water fluoridation. American Dental Association 2005.

[2] Scientific Panel on Dietetic Products, Nutrition and Allergies. Opinion of the Scientific Panel on Dietetic Products, Nutrition and Allergies on a request from the commission related to the tolerable upper intake level of fluoride (request no. EFSA-Q-2003-018).Scientific Panel on Dietetic Products, Nutrition and Allergies 2005.

[3] World Health Organization. Fluoride in drinking water. World Health Organization 2006.

[4] McDonagh, M., Whiting, P., Bradley, M., Cooper, J., et al. A Systematic review of public water fluoridation. NHS Centre for Reviews and Dissemination, University of York 2000.

[5] United Kingdom Medical Research Council. Water fluoridation and health. United Kingdom Medical Research Council 2002.

[6] Irish Ministry for Health and Children. Forum on fluoridation. Irish Ministry for Health and Children 2002.

[7] Lord Mayor's Taskforce on Fluoridation. Report of the Lord Mayor's Taskforce on Fluoridation. Lord Mayor's Taskforce on Fluoridation 1997.

[8] National Health and Medical Research Council Australia. Review of water fluoridation and fluoride intake from discretionary fluoride supplements. National Health and Medical Research Council, Australia 1999.

[9] National Health and Medical Research Council Australia. Systematic review of the efficacy and safety of fluoridation. National Health and Medical Research Council, Australia 2007.

[10] Task Force on Community Preventive Services. Comparison of selected interventions to prevent dental caries, oral and pharyngeal cancers and sports-related craniofacial injuries. American Journal of Preventive Medicine 2002; 23(18):55-80.

[11] Lepo, J. E. and Snyder, Richard A. Impact of fluoridation of municipal drinking water supply: review of the literature. Escambia County Utilities Authority 2000.

[12] United States Centers for Disease Control. Recommendations for using fluoride to prevent and control dental caries in the United States. MMWR 2001; 50(RR14):1-42.

[13] Task Force on Community Preventive Services. Recommendations on selected interventions to prevent dental caries, oral and pharyngeal cancers and sports-related craniofacial injuries. American Journal of Preventive Medicine 2002; 23(18):16-20.

[14] Gooch B.F., Suleman I., Gift H.C. Task Force on Community Preventive Services, et al. Reviews of evidence on interventions to prevent dental caries, oral and pharyngeal cancers and sports-related craniofacial injuries. American Journal of Preventive Medicine 2002; 23(18):21-54.

[15] Locker, D. Benefits and risks of water fluoridation: an update of the 1996 federal provincial sub-committee report. Ontario Ministry of Health 1999.

[16] Expert Panel for Water Fluoridation Review. Report of the Expert Panel for Water Fluoridation Review. Calgary Health Region 1998.

APPENDIX F

SMDHU 2012 ORAL HEALTH MONTH AD CONTENT

APPENDIX F

SMDHU 2012 ORAL HEALTH MONTH ADVERTISING

PRINT AD CONTENT AND RADIO SCRIPTS

#1
Tooth decay – for our children it means pain, difficulty eating, lost time from school and loss of self-esteem.
Cavities can be prevented with

- Tooth brushing at least twice a day … and flossing
- Eating healthy and avoiding too many sweet snacks and drinks
- Regular checkups at your dentist

Fluoride in Orillia's drinking water could bring safe and effective protection against cavities.
April is Oral Health Month. Be good to your teeth.
A message from the Simcoe Muskoka District Health Unit.

#2

If you can't afford a dentist, your public health unit may be able to help.

- Children in Need of Treatment covers urgent dental care for children 17 and under
- Healthy Smiles Ontario offers dental care in clinics and a mobile service for eligible children 17 and under

To find out if you family qualifies, call Your Health Connection at 1-877-721-7520.
April is Oral Health Month. Be good to your teeth.
A message from the Simcoe Muskoka District Health Unit.

#3

Orillia's school children have more tooth decay than most children in Simcoe County.
Fluoride could help.

- It hardens the tooth enamel.
- It prevents bacteria from causing decay.
- It's safe in toothpaste …and when included in drinking water …and at the dentist.
- It's an important part of good oral health care.

April is Oral Health Month. Be good to your teeth.
A message from the Simcoe Muskoka District Health Unit.

#4

Your teeth should last a lifetime. Your public health unit is working to keep your teeth strong.

- We screen school-aged children's teeth
- We teach and promote good oral care, proper nutrition
- We can get dental care for children whose families can't afford a dentist
- We study and report on the oral health of our communities
- We help people understand the value of water fluoridation

April is Oral Health Month. Be good to your teeth.
A message from the Simcoe Muskoka District Health Unit.

APPENDIX G

LIST OF ORGANIZATIONS THAT SUPPORT CWF

National and International Organizations That Recognize the Public Health Benefits of Community Water Fluoridation for Preventing Dental Decay

Academy of Dentistry International
Academy of General Dentistry
Academy for Sports Dentistry
Alzheimer's Association
America's Health Insurance Plans
American Academy of Family Physicians
American Academy of Nurse Practitioners
American Academy of Oral and Maxillofacial Pathology
American Academy of Orthopaedic Surgeons
American Academy of Pediatrics
American Academy of Pediatric Dentistry
American Academy of Periodontology
American Academy of Physician Assistants
American Association for Community Dental Programs
American Association for Dental Research
American Association for Health Education
American Association for the Advancement of Science
American Association of Endodontists
American Association of Oral and Maxillofacial Surgeons
American Association of Orthodontists
American Association of Public Health Dentistry
American Association of Women Dentists
American Cancer Society
American College of Dentists
American College of Physicians–American Society of Internal Medicine
American College of Preventive Medicine
American College of Prosthodontists
American Council on Science and Health
American Dental Assistants Association
American Dental Association
American Dental Education Association
American Dental Hygienists' Association
American Dietetic Association
American Federation of Labor and Congress of Industrial Organizations
American Hospital Association
American Legislative Exchange Council
American Medical Association
American Nurses Association
American Osteopathic Association
American Pharmacists Association
American Public Health Association
American School Health Association
American Society for Clinical Nutrition

American Society for Nutritional Sciences
American Student Dental Association
American Water Works Association
Association for Academic Health Centers
Association of American Medical Colleges
Association of Clinicians for the Underserved
Association of Maternal and Child Health Programs
Association of State and Territorial Dental Directors
Association of State and Territorial Health Officials
Association of State and Territorial Public Health Nutrition Directors
British Fluoridation Society
Canadian Dental Association
Canadian Dental Hygienists Association
Canadian Medical Association
Canadian Nurses Association
Canadian Paediatric Society
Canadian Public Health Association
Child Welfare League of America
Children's Dental Health Project
Chocolate Manufacturers Association
Consumer Federation of America
Council of State and Territorial Epidemiologists
Delta Dental Plans Association
FDI World Dental Federation
Federation of American Hospitals
Hispanic Dental Association
Indian Dental Association (U.S.A.)
Institute of Medicine
International Association for Dental Research
International Association for Orthodontics
International College of Dentists
March of Dimes Birth Defects Foundation
National Association of Community Health Centers
National Association of County and City Health Officials
National Association of Dental Assistants
National Association of Local Boards of Health
National Association of Social Workers
National Confectioners Association
National Council Against Health Fraud
National Dental Assistants Association
National Dental Association
National Dental Hygienists' Association
National Down Syndrome Congress
National Down Syndrome Society
National Foundation of Dentistry for the Handicapped

National Head Start Association
National Health Law Program
National Healthy Mothers, Healthy Babies Coalition
Oral Health America
Robert Wood Johnson Foundation
Society for Public Health Education
Society of American Indian Dentists
Special Care Dentistry
Academy of Dentistry for Persons with Disabilities
American Association of Hospital Dentists
American Society for Geriatric Dentistry
The Children's Health Fund
The Dental Health Foundation (of California)
U.S. Department of Defense
U.S. Department of Veterans Affairs
U.S. Public Health Service
Health Resources and Services Administration (HRSA)
Centers for Disease Control and Prevention (CDC)
National Institute of Dental and Craniofacial Research (NIDCR)
World Federation of Orthodontists
World Health Organization

(Source: American Dental Association, Fluoridation Facts Compendium, http://www.ada.org/4051.aspx)

APPENDIX H

KEY CONCLUSIONS OF FIVE SCIENTIFIC REVIEWS

APPENDIX H - Key Conclusions of Five Recent Scientific Reviews

In recent years, several countries including Canada, Europe, Australia, Ireland and the United Kingdom, have undertaken reviews community water fluoridation. These reviews have utilized dental and scientific experts to assess the evidence in the literature to arrive at conclusions as to the risks and benefits of fluoridated water to prevent dental caries. Five of these reviews and a summary of their key conclusions are listed below:

1. **European Commission, Scientific Committee on Health and Environmental Risks (SCHER) - Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water, 2011**

Key conclusions:

- "There is a risk for dental fluorosis in children with systemic fluoride exposure, and a threshold cannot be detected.
- The occurrence of endemic skeletal fluorosis has not been reported in the EU general population.
- There is not sufficient evidence linking fluoride in the drinking water to the development of osteosarcoma.
- Fluoride intake from drinking water at the level occurring in the EU does not appear to hamper children's neurodevelopment and IQ levels.
- Human studies do not suggest adverse thyroid effects at realistic human exposures to fluoride.
- There is no new evidence from human studies indicating that fluoride in drinking water influences male and female reproductive capacity.
- Water fluoridation as well as topical fluoride applications, e.g. fluoridated toothpaste or varnish, appears to prevent caries, primarily on permanent dentition, but topical application is the more efficient measure.
- In children, a very narrow margin exists between achieving the beneficial effects of fluoride in caries prevention and the adverse effects of dental fluorosis.
- Exposure of environmental organisms to the levels of fluoride used for fluoridation of drinking water is not expected to lead to unacceptable risks to the environment." (pg 39-40)

Reference

European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011.
http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf

2. **Health Canada - Findings and Recommendations of the Fluoride Expert Panel, 2007**

Key conclusions:

- Evidence does not support a link between exposure to fluoride and increased risk of cancer, intelligent quotient deficit, immunotoxicity, reproductive and developmental toxicity, genotoxicity and neurotoxicity.
- Heller *et al.* (1997) concluded that at a fluoride level of 0.7 mg/L in drinking water, fluoridation is a "suitable tradeoff between the risk of dental fluorosis and the protective effect against dental caries". (pg.5)
- From a health perspective, very mild and mild dental fluorosis is not a concern.

Reference

Health Canada (January 2007). Health Canada: Findings and Recommendations of the Fluoride Expert Panel.
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php

3. Australian National Health and Medical Research Council (NHMRC) - A systematic review of the efficacy and safety of fluoridation, 2007

Key conclusions:

- "The existing body of evidence strongly suggests that water fluoridation is beneficial at reducing dental caries." (p. 9)
- "…water fluoridation at levels aimed at preventing dental caries has little effect on fracture risk - either protective or deleterious." (p 11)
- "…there is no clear association between water fluoridation and overall cancer incidence or mortality (for 'all cause' cancer, and specifically for bone cancer and osteosarcoma). (p. 11)

Reference

Australian Government - National Health and Medical Research Council (2007)
A systematic review of the efficacy and safety of fluoridation.
http://www.nhmrc.gov.au/guidelines/publications/eh41a

4. Irish Ministry for Health and Children - Forum on Fluoridation, 2001

Key conclusions:
"Water fluoridation has been very effective in improving the oral health of the Irish population, especially of children, but also of adults and the elderly.
• The best available and most reliable scientific evidence indicates that at the maximum permitted level of fluoride in drinking water at 1 part per million, human health is not adversely affected.

Reference

Irish Ministry for Health and Children, (2002) "Forum on Fluoridation" Irish Ministry for Health and Children.
www.fluoridesandhealth.ie/background/fluoridation_forum.pdf

5. Systematic Review of Water Fluoridation - United Kingdom, 2000

Results: “214 studies were included. The quality of studies was low to moderate. Water fluoridation was associated with an increased proportion of children without caries and a reduction in the number of teeth affected by caries. The range (median) of mean differences in the proportion of children without caries was −5.0% to 64% (14.6%). The range (median) of mean change in decayed, missing, and filled primary/permanent teeth was 0.5 to 4.4 (2.25) teeth. A dose-dependent increase in dental fluorosis was found. At a fluoride level of 1 ppm an estimated 12.5% (95% confidence interval 7.0% to 21.5%) of exposed people would have fluorosis that they would find aesthetically concerning.

Conclusions: The evidence of a beneficial reduction in caries should be considered together with the increased prevalence of dental fluorosis. There was no clear evidence of other potential adverse effects.”

Reference

Marian S McDonagh, Penny F Whiting, Paul M Wilson, Alex J Sutton, Ivor Chestnutt, Jan Cooper, Kate Misso, Matthew Bradley, Elizabeth Treasure and Jos Kleijnen. Systematic review of water fluoridation. BMJ 2000;321;855-859, doi:10.1136/bmj.321.7265.855.
http://www.bmj.com/content/321/7265/855.full

APPENDIX I

MSDS FOR FLUOROSILICIC ACID

SAFETY DATA SHEET
North American Version

FLUOROSILICIC ACID, 23-25%

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or preparation

Product name	:	FLUOROSILICIC ACID, 23-25%
Synonyms	:	Fluorosilicic Acid, Fluosilicic Acid, Hydrofluorosilicic Acid
Molecular formula	:	H2SiF6

1.2. Use of the Substance/Preparation

Recommended use : - Chemical intermediate
- Water treatment

1.3. Company/Undertaking Identification

Address : SOLVAY FLUORIDES, LLC
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

1.4. Emergency and contact telephone numbers

Emergency telephone : **1 (800) 424-9300 CHEMTREC ® (USA & Canada)**
01-800-00-214-00 (MEX. REPUBLIC)

Contact telephone number (product information): : **US: +1-800-765-8292 (Product information)**
US: +1-713-525-6500 (Product information)

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA	:	H= 3 F= 0 I= 0 S= None
HMIS	:	H= 3 F= 0 R= 0 PPE = Supplied by User; dependent on local conditions

General Information

Appearance	:	liquid
Colour	:	colourless
Odour	:	pungent

Main effects

- Hazardous decomposition products formed under fire conditions.
- Corrosive
- Harmful by inhalation, in contact with skin and if swallowed.

2.2. Potential Health Effects:

Inhalation

- Inhalation of vapours is irritating to the respiratory system, may cause throat pain and cough.
- Breathing difficulties

SOLVAY Fluorides

SOLVAY

- Aspiration may cause pulmonary oedema and pneumonitis.
- At high concentrations, risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia.
- Repeated or prolonged exposure: sore throat, Nose bleeding, chronic bronchitis.

Eye contact
- May cause permanent eye injury.
- May cause blindness.
- Intoxication hazards by simultaneous inhalation of the product.
- Symptoms: Burn, Lachrymation, Redness, Swelling of tissue.

Skin contact
- Causes severe burns.
- Risk of shock.
- In case of contact with fingernails, severe pain after several hours.
- Risk of hypocalcemia following the extend of the lesions.
- Intoxication hazards by simultaneous inhalation of the product.
- Symptoms: Irritation, Redness, Swelling of tissue.

Ingestion
- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.
- Risk of throat (o)edema and suffocation.
- Risk of chemical pneumonitis from product inhalation.
- risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia
- Risk of convulsions, loss of consciousness, deep coma and cardiopulmonary arrest.
- Symptoms: Nausea, Bloody vomiting, Abdominal pain, Diarrhoea, Cough, Severe shortness of breath.

Other toxicity effects
- See section 11: Toxicological Information

2.3. Environmental Effects:
- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hydrogen fluoride

CAS-No.	:	7664-39-3
Concentration	:	**<= 1,0 %**

Hexafluorosilicic acid

CAS-No.	:	16961-83-4
Concentration	:	**>= 23,0 - <= 25,0 %**

4. FIRST AID MEASURES

4.1. Inhalation
- In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- Oxygen or artificial respiration if needed.
- Victim to lie down in the recovery position, cover and keep him warm.
- Call a physician immediately.
- Take victim immediately to hospital.

4.2. Eye contact
- Immediate medical attention is required.
- Take victim immediately to hospital.
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).

4.3. Skin contact

- Call a physician immediately.
- Take victim immediately to hospital.
- Take off contaminated clothing and shoes immediately.
- Wash off with plenty of water.
- Keep warm and in a quiet place.

4.4. Ingestion

- Call a physician immediately.
- Take victim immediately to hospital.

If victim is conscious:

- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.

If victim is unconscious but breathing:

- Oxygen or artificial respiration if needed.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which shall not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- The product is not flammable.
- Not combustible.
- Heating can release hazardous gases.
- Gives off hydrogen by reaction with metals.

5.4. Hazardous decomposition products

- Hydrogen
- Hydrogen fluoride

5.5. Special protective equipment for fire-fighters

- Wear self-contained breathing apparatus and protective suit.
- Fire fighters must wear fire resistant personnel protective equipment.
- Wear chemical resistant oversuit
- Protect intervention team with a water spray as they approach the fire.

5.6. Other information

- Cool containers / tanks with water spray.
- Approach from upwind.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- After the fire, proceed rapidly with cleaning of surfaces exposed to the fumes in order to limit equipment damage.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions

- Refer to protective measures listed in sections 7 and 8.
- Approach from upwind.
- Isolate the area.

- Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions.
- Prevent further leakage or spillage if safe to do so.
- Keep away from Incompatible products.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- Avoid spraying the leak source.
- Protect intervention team with a water spray as they approach the fire.

6.2. Environmental precautions

- If the product contaminates rivers and lakes or drains inform respective authorities.
- Do not flush into surface water or sanitary sewer system.

6.3. Methods for cleaning up

- Dam up.
- Soak up with inert absorbent material.
- Prevent product from entering drains.
- Dilute with water.
- Contact with water may produce heat release and presents risks of splashing.
- When diluting, always add the product to water. Never add water to the product.

7. HANDLING AND STORAGE

7.1. Handling

- Used in closed system
- Handle small quantities under a lab hood.
- Use only in well-ventilated areas.
- Use only equipment and materials which are compatible with the product.
- Keep away from Incompatible products.
- Preferably transfer by pump or gravity.
- For further information, please contact:
- Manufacturer, importer, supplier

7.2. Storage

- Keep container tightly closed.
- Keep in a cool, well-ventilated place.
- Keep away from heat.
- Keep away from Incompatible products.
- Keep in a bunded area.
- Information about special precautions needed for bulk handling is available on request.

7.3. Packaging material

- Plastic material
- Steel coated.

7.4. Other information

- Provide tight electrical equipment well protected against corrosion.
- For personal protection see section 8.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Hydrogen fluoride

- OEL (Canada - Ontario)
  CEV = 3 ppm

CEV = 2,5 mg/m3
Remarks: As F

- US. ACGIH Threshold Limit Values 2007
  time weighted average = 0,5 ppm
  Remarks: as F
- US. ACGIH Threshold Limit Values 2007
  Ceiling Limit Value = 2 ppm
  Remarks: as F
- Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) 10 2006
  Ceiling Limit Value = 3 ppm
  Ceiling Limit Value = 2,3 mg/m3
  Remarks: as F
- Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) 07 2007
  Ceiling Limit Value = 2 ppm
  Remarks: as F
- Canada. Ontario OELs. (Ministry of Labor - Control of Exposure to Biological or Chemical Agents) 12 2007
  time weighted average = 0,5 ppm
  Remarks: as F
- Canada. Ontario OELs. (Ministry of Labor - Control of Exposure to Biological or Chemical Agents) 12 2007
  Ceiling Limit Value = 2 ppm
  Remarks: as F
- Canada. Quebec OELS. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) 2006
  Ceiling Limit Value = 3 ppm
  Ceiling Limit Value = 2,6 mg/m3
  Remarks: as F
- Canada. Quebec OELS. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) 2006
  Remarks: as F, Recirculation prohibited
- US. ACGIH Threshold Limit Values 2008
  Remarks: as F, Can be absorbed through skin.

Hexafluorosilicic acid

- US. ACGIH Threshold Limit Values
  Remarks: none established
- US. ACGIH Threshold Limit Values 2008
  time weighted average = 2,5 mg/m3
  Remarks: as F
- Canada. Quebec OELS. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) 2006
  time weighted average = 2,5 mg/m3
  Remarks: as F
- Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) 10 2006
  time weighted average = 2,5 mg/m3
  Remarks: as F
- Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) 07 2007
  time weighted average = 2,5 mg/m3
  Remarks: as F
- Canada. Ontario OELs. (Ministry of Labor - Control of Exposure to Biological or Chemical Agents) 12 2007
  time weighted average = 2,5 mg/m3
  Remarks: as fluoride

8.2. Engineering controls

- Provide appropriate exhaust ventilation at machinery.
- Apply technical measures to comply with the occupational exposure limits.
- Refer to protective measures listed in sections 7 and 8.

8.3. Personal protective equipment

8.3.1. Respiratory protection

- In the case of dust or aerosol formation use respirator with an approved filter.
- Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

8.3.2. Hand protection

- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
- Protective gloves - impervious chemical resistant:
- Suitable material: butyl-rubber

8.3.3. Eye protection

- Face-shield
- Chemical resistant goggles must be worn.

8.3.4. Skin and body protection

- Chemical resistant apron
- If splashes are likely to occur, wear:
- butyl-rubber
- Boots
- Do not wear leather shoes.

8.3.5. Hygiene measures

- Use only in an area equipped with a safety shower.
- Eye wash bottle with pure water
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information

Appearance	:	liquid
Colour	:	colourless
Odour	:	pungent

9.2. Important health safety and environmental information

pH	:	1 *Concentration*: 100 g/l
Boiling point/boiling range	:	108,5 °C (227,3 °F)
Flash point	:	*Remarks*: not applicable
Flammability	:	*Remarks*: The product is not flammable.

Explosive properties	:	*Explosion danger*: *Remarks*: With certain materials (see section 10).
Oxidizing properties	:	*Remarks*: not applicable
Vapour pressure	:	30 hPa *Temperature*: 20 °C (68 °F)
Relative density / Density	:	1,32 *Temperature*: 20 °C (68 °F)
Solubility	:	Water *Remarks*: completely miscible, Reacts violently with water.
Partition coefficient: n-octanol/water	:	*Remarks*: not applicable
Vapour density	:	> 1 *Temperature*: 20 °C (68 °F)

9.3. Other data

Freezing point:	:	< -30 °C (-22 °F)
Decomposition temperature	:	108 °C (226 °F)

10. STABILITY AND REACTIVITY

10.1. Stability

- Stable under recommended storage conditions.
- Corrosive in contact with metals
- Gives off hydrogen by reaction with metals.
- Risk of violent reaction.
- Risk of explosion.

10.2. Conditions to avoid

- To avoid thermal decomposition, do not overheat.
- Keep at temperature not exceeding: 108 °C (226 °F)

10.3. Materials to avoid

- glass, Strong oxidizing agents, Metals

10.4. Hazardous decomposition products

- Hydrogen, Hydrogen fluoride

11. TOXICOLOGICAL INFORMATION

Toxicological data

Acute oral toxicity

- LD 100, guinea pig, 80 mg/kg (2 % solution)

Acute inhalation toxicity

- LC50, 1 h, rat, 850 - 1.070 mg/m3

Irritation (other route)

- Corrosive

Chronic toxicity

- Inhalation, Prolonged exposure, rat, Target Organs**:** Respiratory system, Kidney, Liver, testes, observed effect, (hydrofluoric acid)
- Inhalation, Prolonged exposure, rat, Target Organs**:** cardio-vascular system, nervous system, observed effect, (hydrofluoric acid)

Remarks
- corrosive effects
- Liver and kidney injuries may occur.
- Chronic exposure may entail dental or skeletal fluorosis

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity
- Fishes, Salmo gairdneri, LC50, 96 h, 51 mg/l (Fluorides)
- Crustaceans, Mysidopsis, EC50, 96 h, 10,5 mg/l (Fluorides)
  Remarks: salt water
- Crustaceans, Daphnia magna, EC50, 48 h, 97 mg/l (Fluorides)
  Remarks: fresh water

Chronic toxicity
- Fishes, Salmo gairdneri, LC50, 21 Days, 2,7 - 4,7 mg/l (Fluorides)
- Crustaceans, Daphnia magna, NOEC, 21 Days, 3,7 mg/l (Fluorides)
- Algae, Scenedesmus sp., EC50, 96 h, 43 mg/l (Fluorides)

12.2. Mobility
- Air
  Remarks: mobility as solid aerosols
- Water, Solubility, Mobility
- Soil/sediments, (fluoride)
  Conditions: pH
  Remarks: potential adsorption

12.3. Persistence and degradability

Abiotic degradation
- Air
  Result: neutralization by natural alkalinity
- Water, Soil
  Result: ionization/neutralization
- Water, Soil
  Result: complexation/precipitation of inorganic materials

Biodegradation
- Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

12.4. Bioaccumulative potential
- Bioaccumulative potential: log Pow
  Result: not applicable
- (Fluorides)
  Result: accumulation into vegetable leafs

12.5. Other adverse effects
- no data available

12.6. Remarks
- No data is available on the product itself.

- Ecological data therefore refers only to the effects of the decomposition products.
- Harmful to aquatic organisms.
- Nevertheless, hazard for the environment is limited due to product properties:
- . low chronic toxicity.
- Product fate is highly dependent on environmental conditions: pH, temperature, redox potential, mineral and organic content of the medium,...

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.

13.2. Packaging treatment

- Clean container with water.
- The empty and clean containers are to be reused in conformity with regulations.
- To avoid treatments, as far as possible, use dedicated containers.

13.3. RCRA Hazardous Waste

- Listed RCRA Hazardous Waste (40 CFR 302) - No
- Unlisted RCRA Hazardous Waste (40 CFR 302) - Yes
- D002 (corrosive waste)

14. TRANSPORT INFORMATION

UN-Number	**1778**

IATA-DGR

Class	8
Packing group	II
ICAO-Labels	Corrosive

Proper shipping name: Fluorosilicic Acid

IMDG

Class	8
Packing group	II
ICAO-Labels	Corrosive

Proper shipping name: Fluorosilicic Acid

U.S. Dept of Transportation

Class (Subsidiary)	8
Packing group	II
Label (Subsidiary)	Corrosive
Marine pollutant:	no
Emergency info:	ERG: 154

Proper shipping name: Fluorosilicic Acid

Canada (TDG)

Class (Subsidiary)	8
Packing group	III

Label (Subsidiary)	Corrosive
Marine pollutant:	no
Emergency info:	ERG: 154

Proper shipping name: Fluorosilicic Acid

15. REGULATORY INFORMATION

15.1. Inventory Information

Australian Inventory of Chemical Substances (AICS)	: -	In compliance with inventory.
Canadian Domestic Substances List (DSL)	: -	In compliance with inventory.
Inventory of Existing Chemical Substances (China) (IECS)	: -	In compliance with inventory.
Japan (ENCS) List (ENCS (JP))	: -	In compliance with inventory.
New Zealand Interim Inventory of Chems. (NZ CLSC)	: -	In compliance with inventory.
Toxic Substance Control Act list (TSCA)	: -	In compliance with inventory.
EU list of existing chemical substances (EINECS)	: -	In compliance with inventory.
Korea Existing Chemicals Inv. (KECI) (KECI (KR))	: -	In compliance with inventory.
Philippines PICCS (PICCS (PH))	: -	In compliance with inventory.

15.2. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

- not regulated.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- not regulated.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

- yes.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

- not regulated.

15.3. Classification and labelling

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

- E Corrosive Material

Remarks: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

EC Label

- Hazardous components which must be listed on the label: Hydrogen fluoride / Hexafluorosilicic acid
-

Symbol(s)	Xn	Harmful
R-phrase(s)	R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
	R36/37/38	Irritating to eyes, respiratory system and skin.
S-phrase(s)	S 7/9	Keep container tightly closed and in a well-ventilated place.
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	S36/37	Wear suitable protective clothing and gloves.
	S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

Ratings :

NFPA (National Fire Protection Association)
Health = 3 Flammability = 0 Instability = 0 Special =None

HMIS (Hazardous Material Information System)
Health = 3 Fire = 0 Reactivity = 0 PPE : Supplied by User; dependent on local conditions

Further information

- HF-Antidote Gel from IPS Healthcare is recommended as treatment for injuries from hydrofluoric acid.
- Update
  This data sheet contains changes from the previous version in section(s): 1.1, 1.4
- Distribute new edition to clients

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location. The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product). To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither the company mentioned in section 1 nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. This information gives typical properties only

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This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

APPENDIX J

WSIB REPORT

Workplace Safety and Insurance Board

Commission de la sécurité professionnelle et de l'assurance contre les accidents du travail

Lost Time Injuries for Water Systems

Request ID: 634E
Requested By: Crystal Merriott
Requested Date: February 2, 2012
Prepared By: Corporate Business Analytics, Strategy Cluster

*Data Definitions/Notations:

The following Canadian Standard Association (CSA) Source of Injury Codes & Accident Type Codes have been used as a proxy to identify allowed Lost-Time Injuries for Classification Unit (CU) 4931000: WATER SYSTEMS for Injury years 2007, 2008, 2009, 2010 & 2011.
The Source of Injury CSA Codes have been divided into the following 4 categories:

1- Organic Acids:
01490 - ORGANIC ACIDS, N.E.C.

2- Anything related to Chlorine/Chloride:
01310 - CHLORINE-CONTAINING OXYACIDS
04200 - CHLORINE COMPOUNDS, UNS
04220 - CHLORINE, CHLORINE BLEACH
04290 - CHLORINE COMPOUNDS, N.E.C.
06520 - ORGANOCHLORINE COMPOUNDS
09810 - AMMONIA AND CHLORINE
09820 - CHLORINE AND PHOSPHORIC ACID
09830 - CHLORINE AND CLEANING AGENT, N.E.C.
01120 - HYDROGEN CHLORIDE
04210 - CARBON TETRACHLORIDE
04230 - METHYL CHLORIDE
09540 - VINYL CHLORIDE, POLYVINYL CHLORIDE
01230 - HYDROCHLORIC ACID
04250 - PERCHLOROETHYLENE
04260 - POLYCHLORINATED BIPHENYLS (PCBS)
04270 - TRICHLOROETHYLENE

3- Anything related to Fluorine/Fluoride:
04300 - FLUORINE COMPOUNDS, UNS
04310 - FLUORINE
09210 - LIQUID FLUORINE
01130 - HYDROGEN FLUORIDE
01240 - HYDROFLUORIC ACID
37220 - X–RAY, MAGNETIC RESONANCE IMAGING (MRI's), AND FLUOROSCOPE MACHINERY AND EQUIPMENT

4- Others:
03410 - ANILINE AND OTHER AROMATIC AMINES
06410 - BENZOIC AND PHENYLACETIC ACIDS
06490 - HERBICIDES, N.E.C.
06600 - RODENTICIDES
07920 - TEAR GAS, MACE
01390 - OTHER INORGANIC ACIDS, N.E.C.
04320 - FLUOROTRICHLOROMETHANE

OR
Accident Type CSA Codes:
34400 - INGESTION OF SUBSTANCE
34900 - EXPOSURE TO CAUSTIC, NOXIOUS, OR ALLERGENIC SUBS.

Allowed Lost Time Injuries (LTIs) - all injuries/illnesses by workers who have lost wages as a result of a temporary or permanent impairment for which entitlement to benefits has been authorized. Fatalities have been excluded.

Injury/Illness Year - the year in which the injury/illness occurred.

Data Source: WSIB Enterprise Information (EIW) Warehouse, data as at December 31st, 2011.

	Number of Allowed LTIs for Injury Years 2007 to 2011			
Classification Unit (CU)	**1- 01490 - Organic Acids**	**2- Anything related to Chlorine/Chloride**	**3- Anything related to Fluorine/Fluoride**	**4- Others**
4931000 - WATER SYSTEMS	0	<5	0	0

*Due to privacy reasons, any data with less than 5 cannot be distributed publicly.

APPENDIX K

CERTIFICATE OF ANALYSIS FOR FLUOROSILICIC ACID

SOLVAY FLUORIDES, LLC

CERTIFICATE OF ANALYSIS
SOLVAY CHEMICALS, Inc.

Customer	Certificate recipient

Transport		Batch number	5621232-1
Delivery note		Order	4511535616 000010
Shipping date		Customer ref.	
Packaging		Railcar number	TCIX006968

HYDROFLUOSILICIC ACID 23-25%

Batch number 5621232-1

We certify that product loaded into the vessel meets AWWA Standard B703-06 and ANSI/NSF Standard 60 requirements.

Characteristics	Units	Value	Specification
Assay	%(m)	23.37	23.00 - 25.00
Color	APHA	11.0	<= 100.0
HF	%(m)	0.50	<= 1.00
Specific Gravity @ 60F		1.2230	
Arsenic (As)	ppm	19.60	
Lead (Pb)	ppm	< 1.00	
Heavy Metals (as Pb)	%	< 0.020	
P2O5	%(m)	0.06	

Supplier :

SOLVAY FLUORIDES, LLC
3333 Richmond
77098-3099 Houston,TX
Tel: 713 525-6500 - Fax. 713 525-7806

Approved by

Patricia Hill
Quality & Food Safety Manager
Solvay Chemicals, Inc.
3333 Richmond Ave.
Houston, TX 77098
Phone 713-525-6510

Issued at AURORA on 02/06/2012 at 03:21 PM

APPENDIX L

CITY OF LONDON ONTARIO REPORT DRINKING WATER FLUORIDATION IN LONDON

Agenda Item # Page #

TO:	**CHAIR AND MEMBERS OF THE CIVIC WORKS COMMITTEE MEETING ON APRIL 23, 2012**
FROM:	**JOHN BRAAM, P.ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**
SUBJECT:	**DRINKING WATER FLUORIDATION IN LONDON**

RECOMMENDATION

That, on the recommendation of the Acting Executive Director, Planning, Environmental & Engineering Services & City Engineer, Municipal Council **RECEIVE** this report for information, and **APPROVE** a resolution stating the following:

WHEREAS at the municipal election of 1966, a plebiscite was conducted and Londoners voted in favour of fluoridation of the public water supply of the City;

AND WHEREAS the City of London's drinking water has been fluoridated since September, 1967, as per City of London By-law No. A.-3694-18, as authorized by the Fluoridation Act, and as regulated by the Ministry of the Environment;

AND WHEREAS at the Global Consultation on Oral Health Through Fluoride (2006), the World Health Organization (WHO), the World Dental Federation and the International Association for Dental Research reaffirmed the efficiency, cost-effectiveness, and safety of the daily use of optimal fluoride, and confirmed that universal access to fluoride for dental health is a part of the basic human right to health;

AND WHEREAS more than 90 national and international public health agencies have endorsed the use of fluoride at recommended levels to prevent tooth decay;

AND WHEREAS the U.S. Centers for Disease Control and Prevention declared fluoridation of drinking water to be one of the ten great public health achievements of the 20th century;

AND WHEREAS in June of 2011, Health Canada released the results of a multi-year, systematic review of the health risks associated with fluoride in drinking water and concluded that *"The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects…,*

AND WHEREAS the aforementioned Health Canada review also stated that *"… the optimal concentration of fluoride in drinking water for dental health has been determined to be 0.7 mg/L for communities who wish to fluoridate. This concentration provides optimal dental health benefits and is well below the MAC (Maximum Acceptable Concentration of 1.5 mg/L) to protect against adverse effect"*;

AND WHEREAS in April of 2011, Dr. Arlene King, Ontario's Chief Medical Officer of Health issued a statement expressing concern *"about the loss of fluoridated drinking water in certain communities in spite of consistent evidence that water fluoridation is safe and effective"*;

AND WHEREAS in February of 2011, the Board of Health for the Middlesex-London Health Unit unanimously supported the recommendation of Dr. Graham Pollett, Medical Officer of Health to *"support the ongoing fluoridation of the City of London's drinking water supply as a measure to achieve optimal dental/oral health for all residents, which is an important component of total health"*;

THEREFORE BE IT RESOLVED THAT the Corporation of the City of London affirms its confidence in the integrity and recommendations of the World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Middlesex-London Health Unit, and thus supports the ongoing fluoridation of the City of London's drinking water.

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PREVIOUS REPORTS PERTINENT TO THIS MATTER

- Requests to Discontinue Water Fluoridation in London, October 6, 2008, Environment and Transportation Committee, Agenda Item #2
- Update Regarding Water Fluoridation in London, November 28, 2011, Built and Natural Environment Committee, Agenda Item #2
- Drinking Water Fluoridation in London, January 25, 2012, Civic Works Committee, Agenda Item #1

PREAMBLE

Council and Administration periodically receive correspondence from concerned citizens asking that drinking-water fluoridation be discontinued. Such correspondence typically contains references to purported adverse health effects associated with fluoridation. In 2008, Health Canada assembled an expert panel to conduct a thorough review of the health risks and benefits associated with drinking-water fluoridation. At that time, Administration recommended that Council take no action until staff reported on the results of the Health Canada review.

In June 2011, the results of the Health Canada review were made public, and Administration prepared a report which was presented to the Built and Natural Environment Committee (BNEC) on November 28, 2011. Noting that there were members of the public in attendance who wished to speak to the report, the BNEC opted to defer reception of the report until a Public Participation Meeting (PPM) could be organized. Staff were directed to invite representatives from Health Canada and the Middlesex-London Health Unit to participate in the PPM.

On January 25, 2012, the Civic Works Committee (CWC) received the staff report at a special Public Participation Meeting held in Centennial Hall. The meeting opened with a 30 minute joint presentation by the Director of Water and City Engineer, followed by Dr. Peter Cooney, Chief Dental Officer, Health Canada, and Drs. Graham Pollett and Bryna Warshawsky of the Middlesex-London Health Unit. The public participation portion of the meeting then commenced, and 59 individuals made presentations. 13 presentations were given by medical/dental professionals in support of drinking water fluoridation, and 46 presentations were opposed to fluoridation.

Given the large volume of information presented, and the lateness of the hour when the presentations were completed, the CWC opted not to discuss the report at that time, but made the following recommendation to Council in the 3rd Report of the Civic Works Committee:

Recommendation: *That following actions be taken with respect to the matter of drinking water fluoridation in the City of London:*

a) *the comments and submissions received at the Public Participation Meeting held on January 25, 2012 with respect to drinking water fluoridation in the City of London* ***BE REFERRED*** *to the Civic Administration for review, in consultation with the Middlesex-London Health Unit, and report back at a future meeting of the Civic Works Committee with a recommendation and information clarifying the following matters:*

(i) the legal issues around 'informed consent';
(ii) alternatives, other than nutrition, when water is not fluoridated;
(iii) the toxicity of HFSA (hydrofluorosilicic acid), the product used to fluoridate London's water; and,
(iv) whether the Municipal Council has the legal authority to make the decision to cease fluoridation of the water supply; and,

b) *in the event that a recommendation is put forth that the fluoridation of the City of London's drinking water should cease, the Civic Administration* ***BE REQUESTED*** *to address the necessary steps and associated implications of moving in that direction*

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given that the Elgin Area and Lake Huron Primary Water Supply Systems are jointly operated by municipalities in addition to the City of London, and, further, the City of London has agreements in place for the provision of water to other municipalities from its own secondary water supply system…

Administration's report on the findings of the Health Canada review is presented below, and includes the original Appendices 'A', 'B' and 'C'. Appendix 'D' provides a summary of the issues raised by the 46 individuals who made public presentations on January 25, 2012 opposing drinking-water fluoridation, and Appendix 'E' contains responses to the issues listed in Appendix 'D', as prepared by City of London and Middlesex-London Health Unit staff.

BACKGROUND

Fluoride is a naturally occurring mineral which is present in virtually all water sources. Water found in North America has natural fluoride concentrations ranging from 0.1 mg/L to more than 12 mg/L, with surface water sources (lakes and rivers) tending to have lower fluoride levels than ground water (wells). The City of London receives water from Lakes Huron and Erie, which have relatively low fluoride levels of about 0.1 mg/L. In the early part of the 20th century, it was observed that communities with low natural fluoride levels in their water experienced higher rates of dental caries (tooth decay). Subsequent research confirmed the important role that fluoride plays in preventative oral health.

Fluoridation of drinking water is now practiced by water systems worldwide. The process consists of the controlled addition of fluoride to water with naturally low fluoride levels, thereby raising the fluoride content to an optimal level for the promotion of dental health.

Fluoridation of the City of London's drinking water has been performed since September of 1967, following a public plebiscite in which London's electorate voted in favour of fluoridation.

Research into the health effects of water fluoridation has been ongoing for over 70 years, and the world's foremost dental and medical organizations support and promote the practice. Regardless, there is opposition to water fluoridation, and Council and Administration periodically receive correspondence asking that the practice be ceased.

In October 2008, Administration presented a report to Council advising that City of London staff had recently met with Dr. Neil Farrell, Director, Dental Services of the Middlesex-London Health Unit, at his request, to discuss the most appropriate way to respond to repeated requests to cease fluoridation. Dr. Farrell reported that dental decay is the most common chronic childhood disease. As with many health conditions, there is a strong relationship between low income levels and tooth decay, and it is difficult for a significant portion of the population to pay for necessary dental care. In any poverty reduction strategy, it must be the goal to minimize health problems by maximizing preventive measures, including the use of fluoridated water to prevent tooth decay and its associated problems.

Dr. Farrell also expressed concern that the assertions made in presentations opposing fluoridation cannot be adequately addressed in the limited time allowed at a public meeting or Council session. A typical presentation may include dozens of allegations, quotations and references. In order to properly evaluate the presentation, each argument would need to be fully investigated by qualified personnel in order to determine its authenticity, context and validity; taking into consideration the full spectrum of information available. Dr. Farrell then advised that Health Canada was about to commence just such an exercise through a national consultation process on the Technical Support Document regarding the Canadian Drinking Water Guideline for fluoride in drinking water. This public consultation process would provide an opportunity for all concerned parties to present arguments pertaining to the risks and benefits associated with fluoridation of drinking water.

Health Canada periodically assembles expert panels to conduct these sorts of reviews, and provides them adequate time and resources to evaluate all current information. This process allows all municipalities to benefit from the expert analysis provided, and eliminates the need for multiple jurisdictions to duplicate the evaluation process.

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DISCUSSION

a) Fluoridation Products

Fluoride is a naturally occurring mineral found in rock formations throughout the earth's crust. Water taken from the natural environment contains many minerals, including fluoride, due to the rocks and minerals that the water contacts in nature. There is no such thing as artificial fluoride; all fluoride ions are chemically identical, whether found in natural water sources, or in the rocks and minerals which are mined in order to extract the fluoride.

The source of London's fluoride is a type of rock called fluorapatite, which is mined and processed in Florida, where it is quite abundant. These rocks are rich in both fluoride and phosphorus. The rocks are processed by dissolving them in acid, which allows the fluoride and the phosphorus to be separated, creating hydrofluorosilicic acid and phosphoric acid. Hydrofluorosilicic acid is used for water fluoridation, and phosphoric acid is an important ingredient in chemical fertilizer.

In Canada, the regulation of water treatment products is a provincial responsibility. In Ontario, the Ministry of the Environment (MOE) is the regulating authority. Through London's Municipal Drinking Water Licence, the MOE dictates that any chemicals used to treat the drinking water shall meet all applicable standards set by the American National Standards Institute (ANSI).

"*NSF/ANSI Standard 60: Drinking Water Chemicals - Health Effects*", is the MOE mandated standard for fluoridation products. The NSF/60 Standard is even more stringent than the USP-NF Standard for fluorides used to produce pharmaceuticals. *NSF/60* was developed using U.S. EPA and Health Canada criteria to determine that fluoridation products are safe at their maximum use level, and to evaluate potential contaminants in the products. NSF/60 requires testing of the treatment chemical products, typically by dosing them in water at 10 times the maximum use level, so that trace levels of contaminants can be detected. An evaluation of the test results is required to determine if any contaminant concentrations have the potential to cause adverse human health effects, as per U.S. EPA and Health Canada drinking water guidelines. NSF certifies three products in the fluoridation category:

1. Hydrofluorosilicic acid (the fluoridation product used in London)
2. Sodium fluorosilicate
3. Sodium fluoride

London's drinking water operators review the Certificate of Analysis that is provided with each shipment of hydrofluorosilicic acid, to ensure that it has been tested to meet the NSF/60 Standard.

Hydrofluorosilicic acid (HFSA) is the most commonly used fluoridation product in North America. It has the chemical formula H_2SiF_6. This means that HFSA is composed of hydrogen ions* (*electrically charged atoms), silicon ions and fluoride ions. When HFSA is added to drinking water, it becomes completely dissociated; that is, by interacting with water molecules, the ions separate from each other and disperse into the water. Because of this dissociation, the HFSA that is added to the water actually ceases to exist. The net effect of adding HFSA to the drinking water is that the amount of fluoride, hydrogen and silicon is increased, but no HFSA exists in the water after it is added.

Members of Council have recently received multiple pieces of correspondence claiming that hydrofluorosilicic acid has not had safety studies or toxicology testing for human consumption. Hydrofluorosilicic acid is used for fluoridation worldwide because when it is added to drinking water, it dissociates into its constituent ions and immediately ceases to exist as hydrofluorosilicic acid. People do not ingest hydrofluorosilicic acid when they drink fluoridated water. When researchers and public health officials speak about the safety and effectiveness of fluoridated water, they are referring to water that has been fluoridated with one of the approved fluoridation products; of which, hydrofluorosilicic acid is the most widely used.

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b) World Health Organization

The World Health Organization (WHO) is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries, and monitoring and assessing health trends. According to the WHO constitution, "*the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being..."* With respect to water fluoridation, the WHO states on their website that *"Fluoridation of water supplies, where possible, is the most effective public health measure for the prevention of dental decay."* The WHO also asserts that *"universal access to fluoride for dental health is a part of the basic human right to health."*

c) Health Canada

To properly evaluate the risks and benefits of water fluoridation requires a tremendous commitment of time and effort by informed medical and dental professionals. When evaluating the risks and benefits of a practice such as water fluoridation, health experts employ a process known as a systematic review. A systematic review is a literature review focused on a research question that tries to identify, appraise and synthesize all high quality research evidence relevant to that question. Through the Federal-Provincial-Territorial Committee on Drinking Water, Health Canada periodically assembles expert panels to conduct systematic reviews of their Guideline Technical Documents. Through this process, the most current research findings are evaluated and incorporated into the Guidelines. In January of 2007, Health Canada began conducting such an exercise with respect to the "*Guidelines for Canadian Drinking Water Quality - Guideline Technical Document - Fluoride"*. Health Canada referred to over 400 published scientific studies and included a public consultation process in which interested parties were invited to supply additional information and commentary for consideration. All submitted information was reviewed, and Health Canada released the final 104-page report in June 2011.

The *"Executive summary"* of the Health Canada review is attached as Appendix 'A', along with the *"Health effects"* summary and the *"Dental health benefits"* summary. The following are a few excerpts from the review:

- *"This review assesses all identified human health risks, taking into account new studies and approaches. Based on this review, the guideline for fluoride in drinking water is a Maximum Acceptable Concentration (MAC) of 1.5 mg/L"*

- *"The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to cancer, immunotoxicity, reproductive/developmental toxicity, genotoxicity and/or neurotoxicity. It also does not support a link between fluoride exposure and intelligence quotient deficit, as there are significant concerns regarding the relevant studies, including quality, credibility, and methodological weaknesses"*

- *"Health Canada's Chief Dental Officer has reviewed the available science on dental effects of fluoride, and sought external expert advice from the scientific dental community. Experts provided a recommendation on the optimal level, which was accepted by Health Canada's Chief Dental Officer. As a result, the optimal concentration of fluoride in drinking water for dental health has been determined to be 0.7 mg/L for communities who wish to fluoridate. This concentration provides optimal dental health benefits and is well below the MAC to protect against adverse effect"*

The City of London has been fluoridating to a target value of 0.7 mg/L since the early-1990s, in accordance with recommendations provided by the Director, Dental Services, of the Middlesex-London Health Unit.

One of the concerns expressed by groups opposed to water fluoridation is the possibility of a link between fluoride ingestion and osteosarcoma (a type of bone cancer). According to the International Association for Dental Research, *"The controversy over whether there is an association between fluoride and risk for osteosarcoma has existed since an inconclusive*

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animal study 20 years ago". In July, 2011, after the release of the Health Canada review, a much anticipated Harvard School of Public Health study was published in the Journal of Dental Research. The purpose of this study, titled *"An Assessment of Bone Fluoride and Osteosarcoma"*, was to determine if bone fluoride levels were higher in people with osteosarcoma. This case-control study detected no significant association between bone fluoride levels and osteosarcoma risk.

d) Ontario's Chief Medical Officer of Health

In April of 2011, Dr. Arlene King, Ontario's Chief Medical Officer of Health issued a News Release expressing her support for drinking water fluoridation. Dr. King discussed the benefits and safety of drinking water fluoridation and expressed her concern *"about the loss of fluoridated drinking water in certain communities in spite of consistent evidence that water fluoridation is safe and effective."* Dr. King's News Release is presented as Appendix 'B'.

e) Middlesex-London Health Unit

On February 17, 2011, the Board of Health for the Middlesex-London Health Unit (MLHU) received a staff report recommending that the Board of Health *"…support the ongoing fluoridation of the City of London's drinking water supply as a measure to achieve optimal dental/oral health for all residents, which is an important component of total health."* (reproduced as Appendix 'C'). The MLHU report reviewed the history of water fluoridation and current practices in the City of London, and discussed the safety and effectiveness of water fluoridation. The report noted that the fluoridation of London's water costs approximately $133,000 per year, or about 38 cents per London resident per year. The MLHU report also noted estimates that for every $1 invested in community water fluoridation, $38 in dental treatment costs are avoided. A public partcipation forum was held and several speakers presented arguments in opposition to fluoridation. The Board of Health voted unanimously to support the staff recommendation. The results of the aforementioned Health Canada review support this Board of Health decision.

At the request of a member of Council, the Board of Health received a second staff report on April 14, 2011, which reviewed the findings of the "Review of the U.S. National Research Council Report: Fluoride in Drinking Water". The U.S. National Research Council report's main intent was to assess the health effects of much higher levels of natural fluoride in the U.S. However, there were some findings that related to lower levels of fluoride (such as those in London's water) which, according to the Health Unit report, did not indicate any health concerns.

CONCLUSIONS

In developing, implementing and evaluating policies and programs, Council regularly makes decisions on a diverse array of topics. Some of these decisions involve in-depth analyses of highly technical or scientific information. In such cases, Council must rely upon external expertise to provide analysis and recommendations. For matters pertaining to public health, governments have established local, provincial, federal and international public health agencies to promote wellness, prevent disease, and protect the public's health. These public health agencies provide the expert analysis of current scientific data that governments rely upon to make informed decisions regarding the health of their constituents.

As with other issues of public health policy, there are individuals and organizations who disagree with the conclusions and recommendations of public health agencies regarding water fluoridation. Council and Administration periodically receive correspondence from concerned citizens asking that fluoridation be discontinued. Such correspondence typically contains references to purported adverse health effects associated with fluoridation. The authors of such correspondence are essentially asking Council to evaluate the authenticity and validity of a select fraction of the large volume of material that was recently evaluated by Health Canada, and to then arrive at a different conclusion than the Health Canada experts. In essence, Council is being asked to disregard the expert analysis and recommendations of local, provincial, federal and international public health agencies.

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Administration recommends that Council not abandon the practice of relying upon the expertise provided by our public health officials; but rather, that Council affirm its confidence in the integrity and recommendations of World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Middlesex-London Health Unit, and thus support the ongoing fluoridation of the City of London's drinking water.

Addendum

At the January 25, 2012 Public Participation Meeting, numerous issues were raised in presentations opposing drinking water fluoridation. Administration has listed these issues in Appendix 'D', and through collaboration with the Middlesex-London Health Unit has provided responses in Appendix 'E'. Similarly, when Health Canada conducted the recent review of their fluoride guideline, they included a public consultation phase in which interested parties were invited to submit material for review. Health Canada received and reviewed large volumes of material that presented arguments opposing drinking-water fluoridation. All submitted material was reviewed by Health Canada's expert panel before the final report was released.

As evidenced by the responses in Appendix 'E', Administration is not aware of any new issues raised at the Public Participation Meeting that have not been previously addressed by Health Canada and/or other researchers. After thoroughly reviewing the issues raised on January 25, 2012, Administration does not believe that there is any justification for altering the recommendation provided in this report.

Acknowledgements

This report has been prepared with input from:

- Dr. Graham Pollett, Medical Officer of Health, Middlesex-London Health Unit (MLHU)
- Dr. Bryna Warshawsky, Associate Medical Officer of Health, MLHU
- Dr. Maria vanHarten, Dental Consultant, MLHU
- Paul Sharma, Manager, Oral Health, MLHU
- Roland Welker, Division Manager, Water Engineering, City of London
- Dan Huggins, Water Quality Manager, City of London

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Dr. Bryna Warshawsky – Associate Medical Officer of Health – Middlesex-London Health Unit
Dr. Maria vanHarten, Dental Consultant, MLHU
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Appendix 'A'

Excerpts from the Guidelines for Canadian Drinking Water Quality – Guideline Technical Document – Fluoride, 2011

Executive summary

Low levels of fluoride occur naturally in most sources of drinking water in Canada. Fluoride can occur naturally in surface waters from the deposition of particulates from the atmosphere and the weathering of fluoride-containing rocks and soils, and in groundwater from leaching from rock formations. Fluoride is also introduced in the environment by a variety of human activities such as chemical manufacturing plants and waste ponds; the manufacture of aluminum, steel, glass, enamel, brick, tile, pottery, and cement; production of fluorinated chemical and phosphate fertilizer; and metal casting, welding, and brazing.

Health Canada recently completed its review of the health risks associated with fluoride in drinking water. This review assesses all identified human health risks, taking into account new studies and approaches. Based on this review, the guideline for fluoride in drinking water is a Maximum Acceptable Concentration of 1.5 mg/L.

Health effects

Dental fluorosis is the most widely and frequently studied of all adverse effects of fluoride. It is the effect occurring at the lowest level of fluoride exposure in the population. Mild and very mild dental fluorosis are not considered to be adverse effects, whereas moderate dental fluorosis is found to be an adverse effect, based on its potential cosmetic concern, and is used as the endpoint of concern in the risk assessment used to establish the Maximum Acceptable Concentration. By protecting against a cosmetic effect of moderate dental fluorosis, Canadians are also protected against the adverse health effects of severe dental fluorosis. Skeletal fluorosis is the most serious adverse health effect clearly associated with prolonged exposure to high levels of fluoride in drinking water. Skeletal fluorosis can occur at very high exposure levels, and has rarely been documented in Canada.

The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to cancer, immunotoxicity, reproductive/developmental toxicity, genotoxicity and/or neurotoxicity. It also does not support a link between fluoride exposure and intelligence quotient deficit, as there are significant concerns regarding the relevant studies, including quality, credibility, and methodological weaknesses.

Dental health benefits

Health Canada's Chief Dental Officer has reviewed the available science on dental effects of fluoride, and sought external expert advice from the scientific dental community. Experts provided a recommendation on the optimal level, which was accepted by Health Canada's Chief Dental Officer. As a result, the optimal concentration of fluoride in drinking water for dental health has been determined to be 0.7 mg/L for communities who wish to fluoridate. This concentration provides optimal dental health benefits and is well below the MAC to protect against adverse effects.

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Appendix 'B'

News Release Communiqué

DRINKING WATER FLUORIDATION
STATEMENT FROM DR. ARLENE KING, CHIEF MEDICAL OFFICER OF HEALTH

NEWS April 4, 2011

As Chief Medical Officer of Health for Ontario, I am very concerned about the loss of fluoridated drinking water in certain communities in spite of consistent evidence that water fluoridation is safe and effective.

Support for Water Fluoridation

More than 90 national and international professional health organizations, including Health Canada, the Canadian Public Health Association, the Public Health Agency of Canada, the Canadian Dental Association, the Canadian Medical Association, the U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization, have endorsed the use of fluoride at recommended levels to prevent tooth decay. In fact, the use of fluoride in drinking water has been called one of the greatest public health achievements of the 20th century by the CDC.

Benefits of Water Fluoridation

Combats Tooth Decay

The benefits of water fluoridation are well documented. According to expert research, fluoridated drinking water reduces the number of cavities in children's teeth, which contributes to their healthy development. Reductions of tooth decay have also been observed in adults and seniors who reside in communities with fluoridated water. Even with other sources of fluoride available today, the American Dental Association estimates that water fluoridation continues to be effective in reducing tooth decay by 20-40 per cent.

Conversely, removing fluoride from drinking water systems has the potential to contribute to increased rates of tooth decay. The findings of several studies, including from the CDC, suggest that tooth decay generally increases in a population after water fluoridation is discontinued. In addition, a 2007 report on water fluoridation by the Institut National de Santé Publique du Québec reveals that the percentage of kindergarten children at high risk of developing tooth decay in Dorval, Quebec doubled in the two year period after water fluoridation was halted in 2003.

Reduces Dental Care Expenditures and Inequalities in Health

Water fluoridation also has the capacity to help reduce dental care expenditures. The Ontario Dental Association has stated that the cost of waiting until tooth decay has manifested is significantly higher than the cost of preventing it in the first place. The CDC estimates $38 in avoided costs for dental treatment for every $1 invested in community water fluoridation. With the fluoridation of drinking water playing an important role in the overall promotion of good oral health and prevention of dental decay, I am concerned that removing it from drinking water may put a strain on, and impact the success of, important provincial programs such as the Children in Need of Treatment Program and Healthy Smiles Ontario - both developed to benefit those least able to afford dental services.

And indeed, removing fluoride from drinking water will place those least able to afford or access dental treatment at an increased risk for oral health problems. The health benefits of drinking water fluoridation extend to all residents in a community, regardless of age, socioeconomic status, education or employment.

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Safety of Fluoridated Drinking Water

Fluoride in drinking water is also safe. In Ontario, fluoride additives are required to meet rigorous standards of quality and purity before they can be used. When they are added to water at levels recommended in Ontario and across the country, studies have not linked fluoride to cancer, bone fractures or intelligence levels. Studies have also found that water fluoridation is safe for the environment, and poses no risk to plants and animals.

In addition, most dental fluorosis, a condition that occurs when a child receives too much fluoride during tooth development, is mild and appears as white stains on the teeth. In this mildest form, fluorosis may affect the look of a tooth, but will not affect its function. While moderate or severe fluorosis does occur, the Canadian Health Measures Survey: Oral Health Statistics 2007-2009 concludes that, “[so] few Canadian children have moderate or severe fluorosis that, even combined, the prevalence is too low to permit reporting. This finding provides validation that dental fluorosis remains an issue of low concern in this country.”

Good Oral Health Means Good Overall Health

The importance of maintaining good oral health should not be taken lightly - it is an important part of being healthy overall. As tooth decay is the single most common chronic disease among Canadians of all ages and poor oral health is linked to diabetes, heart disease and respiratory conditions, water fluoridation is, and must be recognized as, a very important public health measure. An estimated 70 per cent of Ontarians currently have access to water that is fluoridated, and I would urge all Ontarians to continue to support the fluoridation of their municipal drinking water systems so that everyone can enjoy the lasting health benefits.

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Appendix 'C'

Board of Health Report - February 17, 2011

MIDDLESEX-LONDON HEALTH UNIT
REPORT NO. 014-11

TO: Chair and Members of the Board of Health
FROM: Graham L. Pollett, MD, FRCPC, Medical Officer of Health
DATE: 2011 February 17

Fluoridation of the City of London's Drinking Water

Recommendation
It is recommended that the Board of Health support the ongoing fluoridation of the City of London's drinking water supply as a measure to achieve optimal dental/oral health for all residents, which is an important component of total health.

Addendum: On February 17, 2011, the Board of Health unanimously voted to support the ongoing fluoridation of the City of London's drinking water supply as per the above recommendation.

Introduction
The Board of Health has considered water fluoridation in several past Board of Health Reports including: Report No. 043-07 re Ontario Fluoridation Office (March 2007), Report No. 107-07 re Request to Establish an Ontario Fluoridation Office (June 2007), Report 111-08 re Water Fluoridation (September 2008) and Report No 006-09 re Water Fluoridation (January 2009) (Appendix A). As well, on October 16, 2008, the Board of Health heard a presentation by Mrs. Carole Clinch, Research Coordinator for the People for Safe Drinking Water, entitled "To Stop Water Fluoridation."

The purpose of this current Board of Health Report is to seek the Board of Health's support for the ongoing fluoridation of London's drinking water. This report will provide an overview of water fluoridation in London including background information on fluoride such as how it works, how its benefits were discovered and its importance as a public health strategy; the process for fluoridating and monitoring London's water and the cost of this process; and the benefits and safety of water fluoridation.

Background
It is increasingly recognized that oral/dental health is an important component of total health. Cavities (also known as tooth decay or dental caries) are holes in the teeth that if left unchecked can lead to pain, infection in the mouth and occasionally in the body, and loss of the tooth. To prevent or alleviate the pain, the hole in the tooth must be filled or the tooth extracted. Despite significant declines in tooth decay over the past decades, it remains a very common chronic childhood disease. A survey of dental indices among Ontario Health Units from 1979 to 2008 revealed that 34% of 5-year-olds had evidence of decay, with even higher rates in older children. Similarly, results from Middlesex-London in 2007-2008 indicated that 35% of 1,264 5-years olds had evidence of ever having tooth decay.

Fluoride is a naturally occurring mineral that has been proven to prevent tooth decay. Fluoride affects the enamel of the teeth such that it stops, or potentially reverses the tooth decay process. Fluoride's main effect occurs after the tooth has erupted into the mouth, as small amounts of fluoride in saliva frequently bathe the tooth. Ingesting high levels of fluoride when the teeth are being formed may cause fluorosis, a cosmetic condition where the teeth have white spots, and in severe cases the teeth can be pitted or have brown stains.

The benefits of fluoride in preventing tooth decay were discovered in the 1930s and 1940s. It was noted that communities with high rates of fluorosis also had low rates of tooth decay. Both the fluorosis and lack of decay were attributed to high levels of natural fluoride in the drinking water. In the 1940s, studies were conducted to assess the effect of low levels of fluoride in drinking water on tooth decay. When comparing cities with fluoride added to the water and non-fluoridated water, it was determined that cities receiving fluoridated water had 50-70% lower rates of tooth decay. Based on amounts of water consumed, a safe level of fluoride was determined that decreased tooth decay without increasing the risk of fluorosis.

By the 1980s, the difference in decay rates between communities with fluoridated and non-fluoridated water had narrowed, in part due to the fact that non-fluoridated cities were also receiving fluoride through foods and beverages that are bottled and processed in areas with fluoridated water (referred to as the "halo effect") and also due to the widespread use of toothpaste with fluoride. Nonetheless, studies have still continued to demonstrate the benefits of fluoridation of the water, and studies where fluoridation is stopped demonstrate an increase in rates of tooth decay, approaching the levels in the non-fluoridated

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group. Fluoridation ensures benefit to all those who drink the water, regardless of socioeconomic status, age, ability to regularly brush teeth, or access to dental care.

The Ontario Ministry of the Environment (MOE) estimates that 70% of Ontario residents receive water that is fluoridated, either naturally or by adding fluoride to the water. As of 2005, community fluoridated drinking water was provided to 43% of Canadians. In the United States, approximately 67% of the population receives optimally fluoridated water. Fluoridation of drinking water is less common in European countries although some countries fluoridate their salt.

Fluoride has been recognized by the United States Center for Disease Control and Prevention as one of the ten great public health achievements of the twentieth century and is supported by numerous public health and oral/dental health organizations. It is estimated that for every $1 invested in community water fluoridation, $38 in dental treatment costs are avoided. In Middlesex-London alone, $596,045 was spent in 2009 to cover the cost of urgent dental treatment for children aged 0-17 years whose families could not afford the cost. For many individuals, particularly those over 17 years of age, financial limitations present a major barrier to accessing basic dental care, making strategies that focus on prevention of dental disease, such as fluoride, very important.

Fluoridation in London

The MOE stipulates that where fluoride is added to drinking water, the concentration be adjusted to 0.5 - 0.8 mg/L, the optimum level for control of tooth decay. The City of London receives its water from two sources – about 85 % from Lake Huron and 15% from Lake Erie. The natural level of fluoride in both these water sources is approximately 0.1 mg/L. This level is too low to prevent tooth decay. As per Ontario's Fluoridation Act, a plebiscite was held in London in 1966 through which residents voted to have fluoride added to the water. Beginning in 1967, Lake Huron water has been fluoridated at the Arva Pumping Station before distribution within London. In 1996, the City of London connected to the Lake Erie system which adds fluoride at the Elgin Area Water Treatment Plant. It should be noted that fluoride is not added to water in any jurisdiction in Middlesex County, although fluoride levels are naturally higher in the Thorndale area.

Addendum: It should also be noted that fluoridated water from the City of London water supply is provided to Arva, Ballymote and Delaware in Middlesex County.

The level of fluoride in London's water is maintained at 0.7 mg/L to provide optimal protection against tooth decay without increased risk of dental fluorosis. The level is continually monitored by the City of London and monthly summaries are provided to the Health Unit. Health Unit staff also provides advice to residents of Middlesex-London on other measures to prevent dental fluorosis such as: not using fluoridated toothpaste for the first two years of life and after that, using only a pea-sized amount of fluoridated toothpaste under adult supervision without swallowing and not using fluoride supplements such as pills or drops. A screening conducted by Health Unit staff in 2006 revealed that London had very low rates of fluorosis of cosmetic concern; of note, the rate in London, where the water is fluoridated (5%), was similar to Strathroy, where the water is not fluoridated (4.6%).

To add fluoride to London's drinking water, hydrofluorosilicic acid is used. The source of this product is an ore that is mined and processed in Florida which is rich in fluoride and phosphorus. The processing involves separating the fluoride from the phosphorus, with the fluoride being used to create hydrofluorosilicic acid and the phosphoric acid being used to create chemical fertilizer. Any substance that is added to drinking water is required to pass rigorous testing to ensure that it meets the high standards that are legislated for the water industry such as the National Sanitation Foundation and American National Standards Institute (NSF/ANSI) Standards for purity. The NSF/ANSI Standards for fluoride products added to drinking water are even more stringent than the US standards that apply to fluoride products used in pharmaceuticals.

A detailed costing of the fluoridation of London's water was done by Mr. Dan Huggins, Water Quality Manager for the City of London. Including annual operating costs and amortized capital costs, the fluoridation of London's water costs approximately $133,000 per year, or about 38¢ per each London resident.

Benefits and Safety of Water Fluoridation

Many research articles have been written with regard to the benefits and safety of water fluoridation. Several systematic reviews (where experts review the scientific papers and draw conclusions based on the papers that are judged to be scientifically sound) have been published. These review papers provide strong support for the ongoing fluoridation of water for the prevention of tooth decay. A summary of the key findings of these reports and the position of credible scientific organizations can be found in Appendix B which is a memo from Dr. David Williams, the Associate Chief Medical Officer of Health for Ontario. Aside from fluorosis, which is very infrequent when levels of fluoride are kept at 0.7 mg /L as in the City of London, the papers also provide no evidence of harm from fluoridation of the water. To quote the most recent review entitled "Fluoride in Drinking Water," which was conducted by Health Canada and issued

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for public comment on November 27, 2010: **(Erratum: This report closed for public comment on November 27, 2009)**

> *"The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to cancer, immunotoxicity, reproductive/developmental toxicity, genotoxicity and/or neurotoxicity. It also does not support a link between fluoride exposure and intelligence quotient deficit, as there are significant concerns regarding the available studies, including quality, credibility, and methodological weaknesses."*

There is also no evidence that fluoride in water has any negative effects on the environment.

Conclusion

The scientific evidence strongly supports the fluoridation of water to prevent tooth decay. The evidence also provides reassurance as to the safety of this important public health strategy. It is recommended that the Board of Health endorse the recommendation to support the ongoing fluoridation of London's water supply as a public health measure to achieve optimal dental/oral health, which is an important component of total health.

This report was prepared by Dr. Bryna Warshawsky, Associate Medical Officer of Health and Director, Oral Health, Communicable Disease and Sexual Health Services.

Graham L. Pollett, MD, FRCPC
Medical Officer of Health

- **This report addresses** the following requirement(s) of the Ontario Public Health Standards: Child Health

Appendices available upon request

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Appendix 'D'

Summary of Comments Provided at the January 25, 2012 Public Participation Meeting of the Civic Works Committee

At the January 25, 2012 Public Participation Meeting of the Civic Works Committee, presentations in support of drinking-water fluoridation were provided by Dr. Peter Cooney, Chief Dental Officer, Health Canada, and Drs. Graham Pollett and Bryna Warshawsky of the Middlesex-London Health Unit.

Dr. Cooney expanded upon the findings of the recent Health Canada review, and provided insight into the evaluation process used. He concluded by re-stating that "Health Canada continues to recognize the benefits of community water fluoridation, and supports it as a safe and effective method to prevent tooth decay."

Drs. Pollett and Warshawsky discussed the mechanisms by which fluoride reduces tooth decay and the supportive findings of several recent systematic reviews performed in Great Britain, the United States, Australia, and Canada. They further discussed the value of water fluoridation in London, the process by which public health policy is formulated and evaluated, and the unanimous recommendation of the Board of Health for the Middlesex-London Health Unit supporting the ongoing fluoridation of London's drinking water.

In the public participation portion of the meeting, thirteen (13) medical and dental professionals also spoke in support of fluoridation, including:

- Ontario's Chief Medical Officer of Health
- The Vice-President of the Royal College of Dental Surgeons of Ontario
- The Director of the Dr. Sandy Kirkley Centre for Musculoskeletal Health, Lawson Health Research Institute, Schulich School of Medicine and Dentistry, University of Western Ontario
- The Acting Director of Dentistry, Schulich School of Medicine and Dentistry, University of Western Ontario
- The Past President of the Ontario Dental Association (an Adjunct Professor in Oral Medicine at the Schulich School of Medicine and Dentistry, University of Western Ontario)
- A representative of the Ontario Association of Public Health Dentistry
- The Manager of Professional Development, Canadian Dental Hygienists Association
- A representative of the Ontario Dental Hygienists' Association
- The Executive Director of the Ontario Dental Assistants Association
- The President of the London and District Dental Society
- A Certified Specialist of Pediatric Dentistry and Adjunct Clinical Professor Schulich School of Medicine and Dentistry, University of Western Ontario
- A Certified Specialist of Pediatric Dentistry practicing in London

In the public participation portion of the meeting, forty-six (46) people spoke in opposition to drinking-water fluoridation. In the list below, staff have summarized the issues raised. As per the direction of the Civic Works Committee, staff have reviewed these issues in consultation with the Middlesex-London Health Unit. Responses to these issues are presented in Appendix 'E'. Some responses deal with several of the issues raised; and for ease of reference, the corresponding "Response **#**" is listed in parentheses following each issue listed below.

1. Water fluoridation is unethical and unlawful as it amounts to medicating citizens without their informed consent. **(Response # 1)**
2. Fluoride is a medicine; therefore it requires labeling, dosage instructions, etc. **(Response # 1)**
3. It is illegal to add to add HFSA to drinking water. **(Response # 1)**
4. Topical fluoride applications are more effective than drinking-water fluoridation. **(Response # 2)**
5. Cheaper /safer alternatives are available - drops, tablets, etc. **(Response # 2)**

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6. 99% of water is not consumed, therefore it would be more cost effective for people to individually fluoridate their drinking water if they so choose. **(Response # 2)**
7. Since only 1% of water is consumed, 99% of our fluoridation costs are wasted money. **(Response # 2)**
8. There have been no toxicology studies or clinical trials for HFSA exposure. **(Response # 3)**
9. HFSA is toxic industrial waste; a by-product of phosphate fertilizer production which contains contaminants. **(Response # 3)**
10. HFSA is industrial grade fluoride, not pharmaceutical grade. **(Response # 3)**
11. HFSA is radioactive. **(Response # 3)**
12. HFSA is classified as a Dangerous Good by Environment Canada TDG regulations and a Class 8 Corrosive. **(Response # 3)**
13. The fluoride added to London's water is not the same as naturally-occurring fluoride. **(Response # 3)**
14. HFSA does not dissociate completely. **(Response # 3)**
15. HFSA re-associates in the stomach**. (Response # 3)**
16. On December 31, 2012, the Standard of Care provision of the Safe Drinking Water Act will be proclaimed into law, making Councillors liable if harm is caused by fluoridation. **(Response # 5)**
17. Council will be responsible if harm occurs due to fluoridation - not health agencies, as they only recommend fluoridation. **(Response # 5)**
18. Fluoride dosage cannot be controlled because water consumption cannot be controlled. **(Response # 6)**
19. People with diabetes drink large amounts of water and are more exposed to fluoride. **(Response # 6)**
20. Cavity rates have declined in non-fluoridated communities, just as in fluoridated communities. **(Response # 7)**
21. Fluoride has a topical effect only; there is no benefit gained by ingesting it. **(Response # 8)**
22. Fluoride does not decrease rates of tooth decay. **(Response # 9)**
23. Ceasing fluoridation will have no impact on cavity rates. **(Response # 10)**
24. Ceasing fluoridation causes a decrease in cavity rates. **(Response # 10)**
25. Vitamin D is more effective in preventing cavities and has no side effects. **(Response # 11)**
26. Health organizations warn that baby formula should not be made with fluoridated water. **(Response # 12)**
27. The American Dental Association has acknowledged that children under 12 months of age should not drink fluoridated water. **(Response # 12)**
28. Fluoride is genotoxic/mutagenic. **(Response # 13)**
29. Fluoride interferes with iodine uptake. **(Response # 14)**
30. Fluoride displaces iodine in the body. **(Response # 14)**
31. Fluoride causes thyroid problems. **(Response # 14)**
32. Fluoride causes endocrine disruption. **(Response # 14)**
33. Fluoride facilitates the bio-availability of aluminum and assists aluminum to cross the blood-brain barrier. **(Response # 15)**
34. Fluoride causes brain/neurological disorders. **(Response # 16)**
35. Fluoride causes diabetes. **(Response # 17)**
36. Fluoride causes skeletal problems. **(Response # 18)**
37. Fluoride causes hip fractures. **(Response # 19)**
38. Fluoride causes cancer. **(Response # 20)**
39. Fluoride causes osteosarcoma. **(Response # 21)**
40. Fluoride causes decreased body weight. **(Response # 22)**
41. Fluoride causes autism. **(Response # 23)**
42. Fluoride causes hyperactivity. **(Response # 24)**
43. Fluoride causes learning disabilities. **(Response # 25)**

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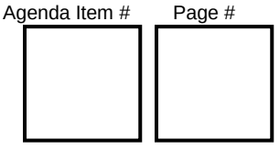

44. Fluoride causes cardiovascular disease. **(Response # 26)**
45. Fluoride causes fluorosis. **(Response # 27)**
46. Fluoride causes lowered IQ. **(Response # 28)**
47. Fluoride causes damage to the pineal gland. **(Response # 29)**
48. Fluoride causes birth defects. **(Response # 30)**
49. Fluoride causes reproductive problems. **(Response # 30)**
50. Fluoride causes stomach problems. **(Response # 31)**
51. Fluoride causes unspecified “health problems”. **(Response # 32)**
52. The City of London does not reveal the true cost of fluoridation because it does not include the costs incurred due to the health problems caused. **(Response # 32)**
53. Some children are allergic to fluoride which can cause depression. **(Response # 33)**
54. Some segments of population are hyper-sensitive to fluoride. **(Response # 34)**
55. The kidneys of young children and the elderly cannot properly excrete fluoride. **(Response # 35)**
56. Native Americans, Latin Americans and African Americans have higher rates of diabetes and kidney disease and are therefore more susceptible to harm from fluoridated water. **(Response # 36)**
57. Latin Americans and African Americans have higher rates of fluorosis and are therefore more susceptible to harm from fluoridated water. **(Response # 37)**
58. Fluoride is absorbed through the skin during showers/baths. **(Response # 38)**
59. Studies have shown that fluoridated water delays tooth eruption, so it simply delays tooth decay. **(Response # 39)**
60. Systematic reviews are not a substitute for peer-reviewed toxicological studies. **(Response # 40)**
61. Cavities are not caused by a fluoride deficiency; they are caused by modern diets. **(Response # 41)**
62. Doctors and scientists have been wrong before. **(Response # 42)**
63. The York review concluded that water fluoridation is not safe, nor could be concluded to be cost-effective. **(Response # 43)**
64. Toothpaste tubes contain a warning to call poison control if you swallow it - therefore fluoride is toxic. **(Response # 44)**
65. The Hazardous Waste Act does not permit HFSA to be added to the environment, yet we return our tap water to the Thames River. **(Response # 45)**
66. Since it is illegal to dump HFSA in the environment, why is it okay to add it to drinking water? **(Response # 45)**
67. It is illegal to discharge fluoridated water to the environment. **(Response # 45)**
68. Environment Canada has a Fluoride Guideline of 0.12 mg/L for water discharged to the environment. **(Response # 45)**
69. Fluoride in our water causes unspecified “harm to the environment”. **(Response # 45)**
70. Discontinuation of fluoridation would save taxpayers money. **(Response # 46)**
71. Fluoride increases lead levels in water by leaching lead from plumbing. **(Response # 47)**
72. Other Canadian cities have stopped fluoridating, so London should as well. **(Response # 48)**
73. There are other jurisdictions in Canada and around the world that do not fluoridate their water, so London shouldn't either. **(Response # 49)**
74. Fluoride is found in rat and cockroach poison. **(Response # 50)**
75. The Material Safety Data Sheet for HFSA is missing key pieces of information, and states that HFSA is a carcinogen. **(Response # 51)**

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Appendix 'E'

Responses to Comments Provided at the January 25, 2012 Public Participation Meeting of the Civic Works Committee

As mentioned in the preamble to this report, following the January 25, 2012 Public Participation Meeting (PPM), the following recommendation was presented to Council in the 3rd Report of the Civic Works Committee:

Recommendation: *That following actions be taken with respect to the matter of drinking water fluoridation in the City of London:*

a) *the comments and submissions received at the Public Participation Meeting held on January 25, 2012 with respect to drinking water fluoridation in the City of London* ***BE REFERRED*** *to the Civic Administration for review, in consultation with the Middlesex-London Health Unit, and report back at a future meeting of the Civic Works Committee with a recommendation and information clarifying the following matters:*

(i) the legal issues around 'informed consent';
(ii) alternatives, other than nutrition, when water is not fluoridated;
(iii) the toxicity of HFSA (hydrofluorosilicic acid), the product used to fluoridate London's water; and,
(iv) whether the Municipal Council has the legal authority to make the decision to cease fluoridation of the water supply; and,

b) *in the event that a recommendation is put forth that the fluoridation of the City of London's drinking water should cease, the Civic Administration* ***BE REQUESTED*** *to address the necessary steps and associated implications of moving in that direction given that the Elgin Area and Lake Huron Primary Water Supply Systems are jointly operated by municipalities in addition to the City of London, and, further, the City of London has agreements in place for the provision of water to other municipalities from its own secondary water supply system…*

Administration has consulted with the Middlesex-London Health Unit to review the written submissions received at the January 25, 2012 Public Participation Meeting, as well as the oral arguments presented (through review of video). The directives of the CWC (above) are addressed below, followed by responses to each issue listed in Appendix 'D'. Some responses address multiple issues, and the heading for each response identifies the specific issues addressed. The heading also identifies whether the response was prepared by Civic Administration, or by the Middlesex-London Health Unit (MLHU).

RESPONSE # 1

- **a) (i) - The legal issues around 'informed consent'**
- **Issue # 1 - Water fluoridation is unethical and unlawful as it amounts to medicating citizens without their informed consent.**
- **Issue # 2 - Fluoride is a medicine; therefore it requires labeling, dosage instructions, etc.**
- **Issue # 3 - It is illegal to add to add HFSA to drinking water**

Part A (Administration)

The ethical aspects of drinking-water fluoridation were very recently addressed in the province of Quebec. Whereas fluoridation is a common practice in Ontario and the United States, it is relatively uncommon in Quebec. The Public Health Ethics Committee (CESP) of the National Public Health Institute of Québec was recently asked to comment upon the ethics of drinking water fluoridation.

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On March 21, 2012, the CESP released their report (1), and the Executive Summary is reproduced below:

EXECUTIVE SUMMARY

"This opinion relates to a project submitted by the National Public Health Director to amend the Regulation respecting the quality of drinking water of the Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP – Ministry of Sustainable Development, Environment and Parks) to include a mandatory minimum standard for fluoride of 0.7 mg/l for all Québec municipalities with populations of 5,000 or more.

Tooth decay and its consequences are a major public health concern affecting the entire Québec population. By way of illustration, tooth decay affects 42% of the province's kindergarten children. In addition, Québec children have 40% more cavities than their counterparts in Ontario and the United States. In Québec, dental treatment costs exceed $2 billion.

The fluoridation of drinking water is presented in the literature as one of the safest, most effective, economical and equitable ways of reducing tooth decay. It has a greater impact on disadvantaged populations, and thus helps reduce health inequalities. The negative effects of fluoridation on health and the environment are not significant enough to outweigh the benefits.

However, the fluoridation of a population's water supply system will inevitably run counter to the wishes of part of that population. To force people to live more healthily against their will is certainly not a trivial matter. It is therefore important to explore ways to mitigate the consequences of such a measure on the free choice of individuals.

In conclusion, the CESP takes the view that the benefits of fluoridation outweigh its potential negative effects on health and the environment and that such benefits justify impinging on the freedom of choice of people who do not wish to have their water fluoridated. This opinion offers ways to mitigate these negative consequences on target populations; these include informing and consulting the public and inviting it to participate in the process leading to the change in regulations on the quality of drinking water."

With respect to the legality of adding HFSA to municipal drinking water, Ontario's Fluoridation Act, 1990 provides municipalities with the legal authority to fluoridate as follows:

"Where a local municipality or a local board thereof owns or operates a waterworks system, the council of the municipality may by by-law establish, maintain and operate, or require the local board to establish, maintain and operate, a fluoridation system in connection with the waterworks system."

In Ontario, the Ministry of the Environment (MOE) dictates that any chemicals used to treat the drinking water shall meet all applicable standards set by the American National Standards Institute (ANSI). "NSF/ANSI Standard 60: Drinking Water Chemicals - Health Effects", is the MOE mandated standard for fluoridation products. NSF certifies three products in the fluoridation category:

1. Hydrofluorosilicic acid (or HFSA, the fluoridation product used in London)
2. Sodium fluorosilicate
3. Sodium fluoride

The City of London Solicitor's Office has provided the following information with respect to the legal aspects of informed consent:

The issue of informed consent has been raised in several Canadian cases. Generally the issue is framed as whether fluoridation of public water amounts to the administration of a drug without the informed consent of the people being medicated. This is often tied to section 7 of the

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Charter and the right to life, liberty and security of the person and the right not to be deprived thereof except in accordance with the principles of fundamental justice.

In the 2003 BC case Millership v. British Columbia (affirmed by BC Court of Appeal and leave to appeal to Supreme Court of Canada denied), the plaintiff sought a declaration that public water fluoridation mass medicates and poisons Canadians by the drug fluoride without their informed consent. The court denied the declaration, and in doing so the court determined that the fluoridation of water was done pursuant to the authority of a by-law after a referendum in support of such by-law by the majority of the residents of the community. The court stated that members of a community are able to obtain information about the fluoridation of water if they wish, and are given an opportunity to debate the issue and take steps to avoid fluoridated water if they wish.

The court also referred to the case Locke v. Calgary (City) where the court found that the by-law did not violate the plaintiff's rights to security of the person, and that in any event such a by-law would be saved by principles of fundamental justice which required a fair balance to be struck between the interests of a person whose claim to security had been violated and those of society. The court in Locke also held that the intrusion by the judiciary into value judgments of the legislature and the electors must be restrained unless there is a clear breach of the Charter established on at least a balance of probabilities by the proponent of such breach.

(1) Comité d'éthique de santé publique. Opinion on a project to fluoridate drinking water. March, 2012

Part B (MLHU)

Fluoride used in drinking water fluoridation is not considered a drug by Health Canada as per the *Food and Drugs Act* and is not regulated by the federal government as a drug (1). Fluoride is considered a non-essential mineral nutrient for the prevention of dental disease. Fluoride added to water in the concentrations available in Canada is considered nutritive as opposed to therapeutic. Fluoride is added to drinking water as a public health measure to protect dental health and prevent or reduce tooth decay.

Nutrients are components of food that help to nourish the body. They provide energy, serve as building material, or help to maintain or repair body parts. Prevention of chronic disease may be considered to be a factor in deciding essential nutrients for the body. (2) Fluoride is considered a non-essential mineral nutrient for the prevention of dental disease. Health Canada considers fluoride to be a beneficial mineral nutrient that occurs naturally in most sources of drinking water. (3)

In a recent report, the World Health Organization (WHO) lists fluoride as one of the 14 minerals considered important for good health (2). Due to its health benefits, the Institute of Medicine of the National Academies of Sciences declared that fluoride was an important nutrient (4) and a report by the U.S. Surgeon General in 2004 states that fluoride is a nutrient that is potentially beneficial for bones. (5)

When a fluoride preparation, such as a dental rinse or toothpaste, includes a therapeutic claim and is represented for sale in Canada, it is considered to be a drug and is regulated accordingly by Health Canada. It is the responsibility of the product submission sponsor to demonstrate compliance with the applicable federal requirements.

Governments and health professionals have a responsibility to make decisions and implement public health strategies that balance community health outcomes with individual choices. Adjusting the level of fluoride in drinking water can be compared to practices such as adding iodine to salt for thyroid health and adding folic acid to cereals to reduce neural tube defects.

(1) Department of Justice Canada. Food and Drugs Regulations. Ottawa, Ontario: 2011.
(2) World Health Organization. Nutrients in Drinking Water. Geneva: 2005.
(3) Health Canada. Fluoride in Drinking Water. Environmental and Workplace Health. [Online] 2011.[Cited: July 22, 2011.] http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/healthsante/faq_fluoride-fluorure-eng.php

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(4) Food and Nutrition Board of the Institute of Medicine. Dietary Reference Intakes: Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride. Washington D.C.: National Academy Press, 1997.
(5) US Department of Health and Human Services. Bone Health and Osteoporosis: A Report of the Surgeon General. Rockville M.D.: Office of the Surgeon General, 2004. p. 166.

RESPONSE # 2 (MLHU)

- **a) (ii) - Alternatives, other than nutrition, when water is not fluoridated**
- **Issue # 4 - Topical fluoride applications are more effective than drinking-water fluoridation**
- **Issue # 5 - Cheaper /safer alternatives are available - drops, tablets, etc.**
- **Issue # 6 - 99% of water is not consumed; therefore it would be more cost effective for people to individually fluoridate their drinking water if they so choose**
- **Issue # 7 - Since only 1% of water is consumed, 99% of our fluoridation costs are wasted money**

While other fluoride application modalities may be as effective or more effective than community water fluoridation, community water fluoridation is the most cost-effective and equitable preventive measure. Community water fluoridation in London costs approximately 38 cents per person per year, and is accessible to all Londoners. Fluoridated water reaches the entire community, regardless of socioeconomic status, education, income or race/ethnicity. (1)

MLHU staff estimated the costs of three alternative methods of delivering fluoride to residents of the City of London.

Alternatives to community water fluoridation aim to provide a benefit as close to that of community water fluoridation as possible. The financial considerations include “All High Risk” groups comprising three major groups who are at higher risk of oral health problems:

- Children
- Seniors
- Individuals who live on low income as defined by the Statistics Canada Low-Income Cut-Off. This includes individuals on the Ontario Disability Support Program and on Ontario Works.

The three alternative models proposed and costed are:

MODEL #1: Topical application of fluoride by Middlesex-London Health Unit employees in newly established dental clinics, and a supportive educational campaign

MODEL #2: Topical application of fluoride in private dental offices, and a supportive educational campaign

MODEL #3: Provision of free toothbrushes and fluoride-containing toothpaste through a mail-out program, and a supportive educational campaign

Assumptions:

- Costs of topical application in the Middlesex-London Health Unit-run clinics and the private dentist offices are for the recommended frequency of twice per year.

- It was determined that identifying addresses for all households with children, seniors and people of low income would not be possible, and would not significantly reduce costs; therefore, costs for the mail out program are for an annual delivery of a yearly supply of toothbrushes and toothpaste to all households in London through a distribution company.

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The Table below provides a summary of the capital, operating, and other costs of each option, including the required Full Time Equivalent (FTE) staffing requirements. Details of these budgets are provided in Appendix 'F'.

	Population	Annual Budget (new FTEs)	One-time Capital Costs
MODEL #1: Topical application of fluoride by Middlesex-London Health Unit employees in new dental clinics, and a supportive educational campaign	**152,789**	**$4,817,635 63 FTEs**	**$1,012,000**
MODEL #2: Topical application of fluoride in private dental offices, and a supportive educational campaign	**152,789**	**$14,683,810 3 FTEs**	**$262,000**
MODEL #3: Provision of free toothbrushes and fluoride-containing toothpaste through a mail-out program, and a supportive educational campaign	**378,809**	**$3,746,860 3FTEs**	**$132,000**

It is important to note that each of the proposed models relies upon the active participation of Londoners to utilize the alternative fluoride delivery method offered. For children, the disabled, and seniors, the proposed models may depend on parents or caregivers to ensure utilization of the alternative methods.

(1) Burt, B A. Fluoridation and social equity. J Public Health Dent, 2002, 62(4): 195-200.

RESPONSE # 3 (Administration)

- **a) (iii) - The toxicity of HFSA (hydrofluorosilicic acid), the product used to fluoridate London's water**
- **Issue # 8 - There have been no toxicology studies or clinical trials for HFSA exposure**
- **Issue # 9 - HFSA is toxic industrial waste; a by-product of phosphate fertilizer production which contains contaminants**
- **Issue # 10 - HFSA is industrial grade fluoride, not pharmaceutical grade**
- **Issue # 11 - HFSA is radioactive**
- **Issue # 12 - HFSA is classified as a Dangerous Good by Environment Canada TDG regulations and a Class 8 Corrosive**
- **Issue # 13 - The fluoride added to London's water is not the same as naturally-occurring fluoride**
- **Issue # 14 - HFSA does not dissociate completely**
- **Issue # 15 - HFSA re-associates in stomach**

Fluoride is a naturally occurring mineral found in rock formations throughout the earth's crust. Water taken from the natural environment contains many minerals, including fluoride, due to the rocks and minerals that the water contacts in nature. There is no such thing as artificial fluoride; all fluoride ions are chemically identical, whether found in natural water sources, or in the rocks and minerals which are mined in order to extract the fluoride.

The source of London's fluoride is a type of rock called fluorapatite, which is mined and processed in Florida. These rocks are rich in both fluoride and phosphorus. The rocks are

processed by dissolving them in acid, which allows the fluoride and the phosphorus to be separated, creating hydrofluorosilicic acid (HFSA) and phosphoric acid. HFSA is used for water fluoridation, and phosphoric acid is an important ingredient in chemical fertilizer. It has been stated that HFSA is a by-product of fertilizer production; it would be equally valid to state that fertilizer is a by-product of HFSA production. As both phosphorous and fluoride are extracted from the same rocks through the same process, it might be most accurate to state that HFSA and fertilizer are co-products of that process.

As with any substance extracted from the natural environment, natural impurities will exist in the HFSA. Purity standards are therefore imposed before the HFSA can be added to drinking water. ‘‘*NSF/ANSI Standard 60: Drinking Water Chemicals - Health Effects*”, is the MOE mandated standard for fluoridation products. *NSF/60* was developed using U.S. EPA and Health Canada criteria to determine that fluoridation products are safe at their maximum use level with respect to potential chemical and radioactive impurities. The NSF/60 Standard is even more stringent than the USP-NF Standard for fluorides used to produce pharmaceuticals. The U.S. Centers for Disease Control and Prevention advise that:

“Some have suggested that pharmaceutical grade fluoride additives should be used for water fluoridation. Pharmaceutical grading standards used in formulating prescription drugs are not appropriate for water fluoridation additives. If applied, those standards could actually increase the amount of impurities as allowed by AWWA and NSF/ANSI in drinking water.

Given the volumes of chemicals used in water fluoridation, a pharmaceutical grade of sodium fluoride for fluoridation could potentially contain much higher levels of arsenic, radionuclides, and regulated heavy metals than a NSF/ANSI Standard 60-certified product.” (1)

London’s drinking water operators review the Certificate of Analysis that is provided with each shipment of hydrofluorosilicic acid, to ensure that it has been tested to meet the NSF/60 Standard.

The City of London receives HFSA in a very concentrated form. In this concentrated state, it is a corrosive acid that must be handled with appropriate precautions. Each litre of concentrated HFSA is mixed into approximately 450,000 litres of water. At this level of dilution, the HFSA molecules become completely dissociated (2); that is, by interacting with water molecules, the ions (predominantly fluoride) that make up the HFSA separate from each other and disperse into the water. Because of this dissociation, the HFSA that is added to the water actually ceases to exist. It was suggested at the Public Participation Meeting that perhaps the ions that formerly made up the HFSA molecules might re-associate in the stomach. For this to happen, the free ions would have to avoid interacting with the multitude of other compounds within the stomach, locate each other, and recombine to form molecules of HFSA. Administration is unaware of any studies that suggest this possibility.

Several speakers at the Public Participation Meeting stated that HFSA has not had safety studies or toxicology testing for human consumption. HFSA is used for fluoridation worldwide because when it is added to drinking water, it dissociates into its constituent ions and immediately ceases to exist as HFSA. People do not ingest, and are not exposed to HFSA when they drink fluoridated water. When researchers and public health officials speak about the safety and effectiveness of fluoridated water, they are referring to water that has been fluoridated with one of the approved fluoridation products; of which, HFSA is the most widely used.

(1) http://www.cdc.gov/fluoridation/fact_sheets/engineering/wfadditives.htm
(2) Finney, W.F. et al. Reexamination of Hexafluorosilicate Hydrolysis by ^{19}F NMR and pH Measurement. Environ. Sci. Technol. 2006, 40, 2572-2577

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RESPONSE # 4 (Administration)

- **a) (iv) - Whether the Municipal Council has the legal authority to make the decision to cease fluoridation of the water supply and,**

- **b) in the event that a recommendation is put forth that the fluoridation of the City of London's drinking water should cease, the Civic Administration BE REQUESTED to address the necessary steps and associated implications of moving in that direction given that the Elgin Area and Lake Huron Primary Water Supply Systems are jointly operated by municipalities in addition to the City of London, and, further, the City of London has agreements in place for the provision of water to other municipalities from its own secondary water supply system…**

When discussing water fluoridation in London, it must first be recognized that London receives its drinking water from two distinct water supply systems; The Lake Huron Primary Water Supply System, and the Elgin Area Primary Water Supply System. London receives 80-85% of its water from the Lake Huron system, and 15-20% is supplied by the Elgin system.

The water that London receives from the Lake Huron system is not fluoridated. The City of London adds fluoride to this water at the Arva Pumping Station.

The water that is received from the Elgin system is fluoridated at the treatment plant near Port Stanley. All of the municipalities that receive water from the Elgin system receive fluoridated water.

With respect to the water received from the Lake Huron system, section 3 of Ontario's Fluoridation Act provides municipal councils with the legal authority to cease fluoridation of the water supply as follows:

> *" Where a local municipality or a local board thereof has a fluoridation system in connection with its waterworks system, the council of the municipality may by by-law discontinue, or require the local board to discontinue, the fluoridation system."*

Council can therefore enact a by-law that requires the discontinuation of the fluoridation system for the water received from the Lake Huron system.

With respect to the water received from the Elgin system, section 5 of Ontario's Fluoridation Act states the following:

> *"A fluoridation system established under subsection (1) shall be discontinued where the councils of both municipalities or of a majority of the municipalities, as the case may be, have passed by-laws requiring the discontinuance of the fluoridation system in their respective municipalities."*

Subsection (1) refers to a situation *"Where a waterworks system is operated by or for two or more local municipalities"*, such as the Elgin Area Primary Water Supply System.

In other words, London's municipal council cannot unilaterally require that the Elgin system discontinue fluoridation. By-laws to that effect would need to be passed by the councils of a majority of the municipalities that comprise the Board of Management for the Elgin Area Primary Water Supply System.

With respect to the other municipalities that receive water from the City of London Water System (Arva, Ballymote and Delaware), these systems are not co-owners of London's system; they are customers that purchase water from the City of London. The situation referred to in subsection (1) above, therefore does not apply.

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RESPONSE # 5 (Administration)

- **Issue # 16 - On December 31, 2012, the Standard of Care provision of the Safe Drinking Water Act will be proclaimed into law, making Councillors liable if harm is caused by fluoridation**
- **Issue # 17 - Council will be responsible if harm occurs due to fluoridation - not health agencies, as they only recommend fluoridation**

On December 31, 2012, Section 19 of the Safe Drinking Water Act will be proclaimed into law. Section 19 is commonly referred to as the "the Standard of Care provision", and is reproduced below:

Standard of care, municipal drinking water system

19. (1) Each of the persons listed in subsection (2) shall,

(a) exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and

(b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. 2002, c. 32, s. 19 (1).

Same

(2) The following are the persons listed for the purposes of subsection (1):

1. The owner of the municipal drinking water system.

2. If the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation.

3. If the system is owned by a municipality, every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system. 2002, c. 32, s. 19 (2).

Offence

(3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).

Same

(4) A person may be convicted of an offence under this section in respect of a municipal drinking water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4).

Reliance on experts

(5) A person shall not be considered to have failed to carry out a duty described in subsection (1) in any circumstance in which the person relies in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report. 2002, c. 32, s. 19 (5).

With respect to the City of London Water System, the Standard of Care provision will include London's Municipal Councillors, among those who could be charged with an offence if they fail to exercise their responsibilities toward the operation of the water system in the manner detailed in subsection (1); i.e. to (a) exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and (b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system.

With respect to drinking-water fluoridation, the Executive Director, Planning, Environmental & Engineering Services & City Engineer has provided this report recommending that Council

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support the ongoing fluoridation of the City of London's drinking water. This recommendation is based upon recommendations of the World Health Organization, Health Canada, Ontario's Chief Medical Officer of Health, and the Medical Officer of Health for the Middlesex-London Health Unit. These individuals and organizations have advised that not only does drinking-water fluoridation cause no harm, but that it provides significant oral health benefits.

Subsection (5) explicitly states that no person will be considered to have failed in their duties if they relied in good faith on a report of a person whose professional qualifications lend credibility to the report.

RESPONSE # 6 (MLHU)

- **Issue # 18 - Fluoride dosage cannot be controlled because water consumption cannot be controlled.**
- **Issue # 19 - People with diabetes drink large amounts of water and are more exposed to fluoride**

Health Canada is aware that different people consume different amounts of water. The risk assessment approach used by Health Canada to establish drinking water guidelines for fluoride in drinking water included an estimation of the total daily intake of fluoride from all sources of exposure for all age groups. The Maximum Acceptable Concentration of 1.5 mg/L for fluoride in drinking-water was established based on the segment of the population most at risk of developing dental fluorosis, children 1–4 years old. Health Canada calculated a Tolerable Daily Intake (TDI) value for fluoride from all sources to prevent moderate dental fluorosis in 1-4 year old children. The TDI value was calculated at 0.105 mg/kg bw/day (mg of fluoride per kg of body weight per day). (1)

A total diet survey conducted in 2007 estimated the dietary intakes of fluoride in the Canadian population. The authors found that the average dietary intake of fluoride in the 1 to 4-year-old group is estimated to be 0.026 mg/kg bw/day and 0.016 mg/kg bw/day in fluoridated and non-fluoridated communities, respectively. These values are well below Health Canada's TDI value. The average dietary intakes of fluoride in the Canadian population aged 20 years and older are estimated to vary between 0.024 to 0.033 mg/kg bw/day in non-fluoridated communities and between 0.038 to 0.048 mg/kg bw/day in fluoridated communities; also well below Health Canada's TDI value. (2)

People with uncontrolled diabetes mellitus and people with another less common kind of diabetes called diabetes insipidus can drink large amounts of water. The National Research Council report calculated the estimated daily intake of fluoride in these groups. (3) At 1.0 mg /L of fluoride in water, only those who drink very large amounts of water (eg. 2 litres per day for a child; 10 litres per day for an adult) exceeded Health Canada's tolerable daily intake of 0.105 mg/kg bw/day of fluoride. It should be noted that very high levels of water consumption would likely only occur when diabetes is not adequately controlled, since adequate treatment will lower the daily intake of water. It should also be noted that London's water is fluoridated at 0.7 mg/L, not 1.0 mg/L, which would result in less fluoride exposure even when drinking large amounts of water.

(1) Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride December 2010 http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php#a916 Page 26

(Note that further references to this report will refer to it as the "Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride**"**)

(2) Dabeka, R W, Carrier, R and Martinova, N. Report on fluoride levels in total diet samples and estimated dietary intakes of fluoride by Canadian adults and infants. Ottawa: Food Directorate

(3) National Research Council of National Academies, Committee on Fluoride in Drinking Water, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. 2006. National Academies Press. Washington. D.C. http://www.nap.edu/catalog.php?record_id=11571 . Pages 32-33, 35 and 65.

(Note that further references to this report will refer to it as "The National Research Council Report")

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RESPONSE # 7 (MLHU)

- **Issue # 20 - Cavity rates have declined in non-fluoridated communities, just as in fluoridated communities**

Cavity rates have declined in non-fluoridated communities for a variety of reasons. The adapting of improved hygiene habits and availability of home-use fluoridated toothpastes have been influential but cannot be credited solely for the decline. In Canada, the “halo” or “diffusion” effect has played a role. The effect occurs when foods and beverages processed in a fluoridated community are consumed in a community without fluoridation. This “diffusion” effect results in an increased fluoride exposure among people in non-fluoridated communities, which provides them increased protection against dental decay. (1) Failure to account for this effect can potentially underestimate the total benefit of water fluoridation. (2)

Where water fluoridation may not be feasible, alternative modalities may be used for fluoride delivery and this has contributed to the decline of caries. These modalities include salt fluoridation, milk fluoridation, and fluoride supplements (e.g. pills or drops). It is also important to recognize that several countries, particularly in Europe, have either universal or semi-universal dental care or school dental programs that allow residents or schoolchildren to access fluoride treatments and preventive services at little or no cost to them. (3)

The results of two recent well-conducted Danish studies indicate that despite the availability of fluoridated toothpaste and access to dental care and education, fluoride in water remains an important factor in preventing cavities.

In Denmark, municipalities must offer comprehensive dental care to all children until age 18, and nearly all toothpaste sold since the 1960s has been fluoride-containing. Despite the extensive use of fluoridated toothpaste, the first study (4) revealed that a large part of the inter-municipal variation in caries in children and adolescents could be explained by variation in naturally occurring fluoride in the drinking water supply. As the concentration of fluoride increased, the prevalence of caries decreased.

The second study (4), whose methodology included the data from 178,147 children from across the country, and which accounted for known factors that can also affect decay rates, such as family income, confirmed this correlation. This study showed that fluoride concentration in drinking water was a strong predictor of the risk of dental decay (with higher rates of decay in areas with lower natural fluoride levels in the water, and lower rates of decay with higher natural fluoride levels in the water) despite alternative sources of topical fluoride and excellent access to preventive services.

(1) Health Canada. . Fluoride in Drinking Water. Environmental and Workplace Health. Available at http://www.hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/draft-ebauche-eng.php#t58
(2) American Dental Association. Fluoridation Facts. Printed in US : 2005.
(3) Ekstrand KR, Christiansen MEC, Qvist V. Influence of different variables on the inter-municipality variation in caries experience in Danish adolescents. Caries Res 2003;37:130–41.
(4) Kirkeskov L, Kristiansen E, Bøggild H, von Platen-Hallermund F, Sckerl H, Carlsen A, Larsen MJ, Poulsen S. The association between fluoride in drinking water and dental caries in Danish children. Linking data from health registers, environmental registers and administrative registers. Community Dent Oral Epidemiol 2010; 38: 206–212.

RESPONSE # 8 (MLHU)

- **Issue # 21 - Fluoride has a topical effect only; there is no benefit gained by ingesting it**

Although initially fluoride’s main effect was thought to be systemic from ingestion, the research indicates that fluoride’s primary mechanism of action is topical. (1) Fluoride contained in drinking water bathes the surfaces of the teeth throughout the course of the day through drinking and rinsing. This fluoride acts to prevent cavities by assisting in the repair of the enamel on the surface of the teeth which is damaged by acid in the mouth. If left unchecked, this damage can eventually lead to cavity formation. In the processes of repairing the enamel, fluoride

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strengthens the teeth and makes them more resistant to future attacks from acid in the mouth. (2) (3)

(1) Health Canada. . Fluoride in Drinking Water. Environmental and Workplace Health. Available at http://www.hc-sc.gc.ca/ewh-semt/consult/_2009/fluoride-fluorure/draft-ebauche-eng.php#t58
(2) Groeneveld, A., Van Eck, A.A.M.J. and Backer Dirks, O. (1990) Fluoride in caries prevention: is the effect pre- or post-eruptive? J. Dent. Res., 69 (Spec. Iss.): 751-755.
(3) Thylstrup, A. (1990) Clinical evidence of the role of pre-eruptive fluoride in caries prevention. J. Dent. Res., 69 (Spec. Iss.): 742-750.

RESPONSE # 9 (MLHU)

- **Issue # 22 - Fluoride does not decrease rates of tooth decay**

The best available evidence points to the contrary. According to the York review (1), the research indicates that fluoridation of drinking water supplies does reduce caries prevalence, as measured by the proportion of children who are caries free and by the average number of cavity-affected teeth. Based on the studies assessed in the York review, it was found that fluoridated areas had an average of 14.6% more children who had no cavities when compared to non-fluoridated areas.

A more recent systematic review and meta-analysis demonstrated that adults also benefit from the caries preventative effect of fluoridated water. (2) Adults with lifelong exposure to fluoridated drinking water were at reduced risk of developing tooth decay. This has important public health implications since, with the exception of water fluoridation virtually all primary preventive programs target children and youth.

See also Response #7 and Response #8 for additional information on the benefits of fluoride and its mechanism of action.

(1) McDonagh, M.S., Whiting, P.F., Wilson, P.M., Sutton, A.J., Chestnutt, I., Cooper, J., Misso, K., Bradley, M ., Treasure, E. and Kleijnen, J. (2000) Systematic review of water fluoridation. Br. Med. J., 321: 855-859.
(2) Griffin, SO, et al. Effectiveness of fluoride in preventing caries in adults. J Dent Res, 2007, 86(5): 410-5.

RESPONSE # 10 (MLHU)

- **Issue # 23 - Ceasing fluoridation will have no impact on cavity rates**
- **Issue # 24 - Ceasing fluoridation causes a decrease in cavity rates**

If community water fluoridation ceases, an eventual increase in cavity rates among people of all ages can be expected. Numerous studies have been conducted to evaluate the impact on dental rates as a result of the discontinuation of water fluoridation.

Antigo, Wisconsin fluoridated its water supply from 1949 until 1960. Five years after ceasing fluoridation, tooth decay in second grade, fourth grade, and sixth grade schoolchildren increased 70-200%. As a result, in 1965, fluoridation was re-instituted (1). Anglesey, North Wales, had a fluoridated water supply from 1955 to 1991. From fluoridated 1987 to non-fluoridated 1993, the decay rate in 5 year old children increased 151%. (2) (3)

In 2002, an independent task force convened by the Centers for Disease Control and Prevention examined the ‘before and after’ measurements of caries at the tooth level. They found that initiating, or continuing, fluoridation decreased tooth decay among children aged 4 to 17 years by a median of 29.1% during 3 to 12 years of follow-up. They also discovered that discontinuation of fluoridation was associated with a median increase of 17.9% in dental caries during 6 to 10 years of follow-up. (4)

Prior to the discontinuation of fluoridation in Dryden, Ontario, decay rates for 4 to 5 year old children had shown a continual decline from the time of inception. However, after fluoridation

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was discontinued in 2001, children within the community's schools showed an increase in decay rates of approximately 26%.

Community water fluoridation in Dorval was discontinued in 2003. In the 2-year period that followed, the percentage of kindergarten children at high risk of developing dental cavities doubled: rising from 8% to 17%. (5)

Some fluoridation cessation studies have produced results different than those described above. In these research papers (6) (7) (8) (9), decay rates did not increase with the discontinuation of fluoride. The authors of these papers consistently noted that preventive service utilization either increased after fluoridation cessation (6) (8) or aggressive public topical fluoride and/or sealant programs were already in place (7) (9). One group of Finnish researchers stressed that their findings of non-increasing decay rates "must not be extrapolated to countries with less intensive preventive dental care" (7), as would be the case in Ontario.

(1) Lemke, C W, Doherty, J M and Arra, M C. Controlled fluoridation: the dental effects of discontinuation in Antigo, Wisconsin. J Am Dent Assoc, 1970, 80:7882-6.
(2) Thomas, F, Kassab, J and Jones, B. Fluoridation in Anglesey 1993: a clinical study of dental caries in 5-year old children who had experienced sub-optimal fluoridation. Br Dent J, 1995, 178(2):55-9.
(3) Hulse, G, et al. Welsh water should reinstate fluoridation on Anglesey. Br Dent J, 1995, 178(2): 46-47.
(4) Truman, B I, et al. Reviews of evidence on interventions to prevent dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries. Am J Prev Med, 2002, 23(Suppl 1): 21S-54S.
(5) Levy, M. Update on Water Fluoridation in Quebec (French) from INSPQ Water fluoridation: An analysis of the health benefits and risk. 2007. 9e Quebec Public Health Meeting.
(6) Maupome G, Clark DC, Levy SM, Berkowitz J. (2001). Patterns of dental caries following the cessation of water fluoridation. Community Dentistry and Oral Epidemiology 29: 37-47.
(7) Seppa L, Karkkainen S, Hausen H, M. Larmas (2002). Caries Occurrence in a Fluoridated and a Nonfluoridated Town in Finland: A Retrospective Study Using Longitudinal Data from Public Dental Records. Caries Research 36 (5): 308-314.
(8) Kunzel W, Fischer T, Lorenz R, Bruhmann S. (2000). Decline of caries prevalence after the cessation of water fluoridation in the former East Germany. Community Dentistry
(9) Kunzel W, Fischer T. (2000). Caries prevalence after cessation of water fluoridation in La Salud, Cuba. Caries Research 34: 20-5.

RESPONSE # 11 (MLHU)

- **Issue # 25 - Vitamin D is more effective in preventing cavities and has no side effects**

Vitamin D's main function is to maintain blood levels of calcium and phosphorus within the normal physiologic range to support metabolic functions, neuromuscular transmission, and bone mineralization. (1) Optimal vitamin D intake is required during bone formation to prevent rickets and is also thought to be integral to tooth development. (1) Although some researchers in the 1930s anecdotally observed that vitamin D deficiency in childhood was associated with weak enamel (2) (3) (4), no modern study has shown that vitamin D supplementation reduces the incidence of childhood caries. (5)

Vitamin D is not believed to have any direct cavity-fighting properties, and therefore would be an ineffective preventive measure.

Vitamin D in high doses does have side effects. Excessive doses of vitamin D in addition to usual dietary sources and fortified foods can result in hypervitaminosis whose symptoms include nausea, vomiting, and weakness; related to high calcium levels in the blood (hypercalcemia). (6)

(1) Holick, M.F. Vitamin D. InModern nutrition in health and disease. 10th edition. M. Shils et al., editors. Lippincott Williams & Wilkins. Baltimore, Maryland, USA. 2005. 329–345.
(2) Hess, A.F. Rickets including osteomalacia and tetany. Lea & Febiger. Philadelphia, Pennsylvania, USA. 1929. 401–429.
(3) Hess, A.F. Collected writings. Volume 1. Charles C. Thomas. Springfield, Illinois, USA. 1936. 669–719.

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(4) Eliot, M.M., and Park, E.A. Rickets. In Brennemann's practice of pediatrics. Volume 1. W.F. Prior Company Inc. Hagerstown, Maryland, USA. 1938. 1–110.
(5) Schroth et al. Prevalence of caries in preschool-aged children in a Northern Manitoba Community. J Can Dent Assoc, 2005, 71 (1), 27.
(6) Kulie, T. et al. Vitamin D: an evidence-based review. J Am Brd Med, 2009, 22: 698-706.

RESPONSE # 12 (MLHU)

- **Issue # 26 - Health organizations warn that baby formula should not be made with fluoridated water**
- **Issue # 27 – The American Dental Association has acknowledged that children under 12 months of age should not drink fluoridated water**

Both of these statements are incorrect. The following is stated with regard to fluoridated water and infant formula preparation (and hence use of fluoridated water for children under 12 months of age) by health organizations:

Health Canada: Can I Prepare Baby Formula Using Fluoridated Water?

Yes. Infant formula prepared with water fluoridated at the optimal level of 0.7 mg/L maximizes the protective role of fluoride during the development of the permanent teeth while minimizing the risk of dental fluorosis. (1)

American Dental Association:

The panel suggested that when dentists advise parents and caregivers of infants who consume powdered or liquid concentrate infant formula as the main source of nutrition, they can suggest the continued use of powdered or liquid concentrate infant formulas reconstituted with optimally fluoridated drinking water while being cognizant of the potential risks of enamel fluorosis development. (2)

Centers for Disease Control and Prevention: Can I use optimally fluoridated tap water to mix infant formula?

Yes, you can use fluoridated water for preparing infant formula. However, if your child is exclusively consuming infant formula reconstituted with fluoridated water, there may be an increased chance for mild dental fluorosis. To lessen this chance, parents can use low-fluoride bottled water some of the time to mix infant formula; these bottled waters are labeled as de-ionized, purified, demineralized, or distilled. (3)

It should be noted that acceptable adjusted and natural fluoride levels in the United States are higher than in Canada, and therefore fluorosis levels in the United States are higher than in Canada. This may explain the slightly more conservative language in American recommendations noted above.

(1) Health Canada: http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/health-sante/faq_fluoride-fluorure-eng.php Accessed March 6, 2012
(2) American Dental Association, The Journal of the American Dental Association January 2011 vol. 142 no. 1 79-87 http://jada.ada.org/content/142/1/79.full#sec-18
(3) Centers for Disease Control and Prevention (CDC) http://www.cdc.gov/fluoridation/safety/infant_formula.htm. Accessed January 22, 2012

RESPONSE # 13 (MLHU)

- **Issue # 28 - Fluoride is genotoxic / mutagenic**

Genotoxicity or mutagenicity refers to the ability of a substance to produce effects on the genetic material of cells. The cells can be either of animal or human origin and can be exposed to the substance outside of the body (in vitro) or in the body (in vivo). The National Research

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Council report reviewed several studies on genotoxicity with respect to fluoride. The in vitro studies "are inconsistent and do not strongly indicate the presence or absence of genotoxic potential of fluoride". Regarding the in vivo studies, the report states that "the inconsistencies in the results of these in vivo studies do not enable a straightforward evaluation of fluoride's practical genotoxic potential in humans." (1)

A review of the evidence by Health Canada indicated that "The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to cancer, immunotoxicity, reproductive/developmental toxicity, **genotoxicity** and/or neurotoxicity." (2)

(1) National Research Council Report. Page 316
(2) Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride. Page 1

RESPONSE # 14 (MLHU)

- **Issue # 29 - Fluoride interferes with iodine uptake**
- **Issue # 30 – Fluoride displaces iodine in the body**
- **Issue # 31 – Fluoride causes thyroid problems**
- **Issue # 32 – Fluoride causes endocrine disruption**

Iodine is important for the production of thyroid hormones, which is why iodine is added to salt. Low iodine intake leads to low thyroid function (hypothyroidism) and/or an enlargement of the thyroid gland in the neck (goitre). The possibility that fluoride may contribute to low thyroid function is explored in the US National Research Council report. (1) In this report, several animal and human studies are quoted. Some of these studies suggest an association between fluoride and abnormal thyroid function at high fluoride levels and/or when iodine levels are levels are low. Many of the human studies were performed in developing countries where there are nutritional deficiencies not commonly seen in developed countries like Canada. Because the studies mostly involve high fluoride levels and/or low iodine levels and take place in developing countries, the findings have little relevance to London where fluoride level are low, iodine intake is adequate, and there is very different nutritional intake compared to developing countries. A review of conventional sources of medical information reveals that fluoride exposure is not discussed as a cause of hypothyroidism. (2) (3) (4) (5) (6)

(1) National Research Council Report Pages 224-236
(2) Kronenberg H et al., Editors. Williams Textbook of Endocrinology – 11th Edition. Saunders, Elsevier. Philadelphia, 2008
(3) Molina P, Endocrine Physiology, Third Edition. McGraw-Hill Medical. New York. 2010
(4) Braverman, Lewis E., Utiger, Robert D. Werner & Ingbar's The Thyroid: A Fundamental & Clinical Text (9th Edition) Lippincott Williams & Wilkins, 2005.
(5) Up to Date. "Disorders that cause hypothyroidism". http://www.uptodate.com.proxy2.lib.uwo.ca:2048/contents/disorders-that-cause-hypothyroidism?source=search_result&selectedTitle=4%7E150 Accessed March 26, 2011.
(6) Fauci AS et al. Editors, Harrison's Principles of Internal Medicine – 17th Edition, McGraw-Hill Companies Inc. United States of America. 2008.

RESPONSE # 15 (MLHU)

- **Issue # 33 - Fluoride facilitates the bio-availability of aluminum and assists aluminum to cross the blood-brain barrier**

A few studies done by the same author in the 1990's in a small number of rats suggested that fluoride may increase the uptake of aluminum into the brain. (1) (2) No studies in humans are reported in either the National Research Council report or the Health Canada report to suggest any implications of this finding in humans.

(1) National Research Council Report. Pages 216 – 218
(2) Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride Page 49.

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RESPONSE # 16 (MLHU)

- **Issue # 34 - Fluoride causes brain / neurologic disorders**

Allegations of brain / neurologic disorders are based on animal studies using high doses of fluoride or unconventional methods which make them difficult to interpret and/or apply to humans. (1) (2) No human studies demonstrate an association between fluoride and dementia (such as Alzheimer's diseases). (3) Studies that suggest hydrofluorosilicic acid increases lead levels in water (which can cause neurologic problems) have also been found to lack credibility by other authors. (4)

Also see … Response # 15, Fluoride facilitates the bio-availability of aluminum and assists aluminum to cross the blood-brain barrier, Response # 28, Fluoride causes lowered IQ, and Response #47, Fluoride increases lead levels in water by leaching lead from plumbing.

(1) Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride. Page 48-50.
(2) National Research Council Report. Pages 205–223
(3) National Research Council Report. Pages 210-212
(4) National Research Council Report Page 209-210

RESPONSE # 17 (MLHU)

- **Issue # 35 – Fluoride causes diabetes**

Standard medical text books do not consider fluoride as a cause of or contributor to diabetes. (1) (2) (3) (4) (5) The Health Canada report does not contain any studies regarding an association between fluoride and diabetes. (6) The US National Research Council report references a few animal and human studies which either found no effect of fluoride on diabetes or that very high levels of fluoride may worsen diabetes. (7) There is no evidence that fluoride causes or contributes to diabetes at the levels used in London's water.

(1) Kronenberg H et al., Editors. *Williams Textbook of Endocrinology* – 11th Edition. Saunders, Elsevier. Philadelphia, 2008
(2) Molina P, *Endocrine Physiology,* Third Edition. McGraw-Hill Medical. New York. 2010
(3) Up to Date. "Epidemiology, presentation, and diagnosis of type 2 diabetes mellitus in children and adolescents". http://www.uptodate.com.proxy2.lib.uwo.ca:2048/contents/epidemiology-presentation-and-diagnosis-of-type-2-diabetes-mellitus-in-children-and-adolescents?source=search_result&selectedTitle=2%7E150 Accessed March 26, 2011.
(4) Up to Date "Epidemiology, presentation, and diagnosis of type 1 diabetes mellitus in children and adolescents". http://www.uptodate.com.proxy2.lib.uwo.ca:2048/contents/epidemiology-presentation-and-diagnosis-of-type-1-diabetes-mellitus-in-children-and-adolescents?source=search_result&selectedTitle=3%7E150 Accessed March 26, 2011.
(5) Fauci AS et al. Editors, *Harrison's Principles of Internal Medicine – 17th Edition,* McGraw-Hill Companies Inc. United States of America. 2008.
(6) Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride
(7) National Research Council report. Pages 256-260

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RESPONSE # 18 (MLHU)

- **Issue # 36 – Fluoride causes skeletal problems**

At very high levels, fluoride can lead to skeletal fluorosis, a condition where fluoride accumulates in the bone and results in crippling calcifications in the joints, ligaments and vertebral bodies. It is a problem seen in developing countries with very high levels of natural fluoride in their water. Based on Health Canada's recent review, skeletal fluorosis is not a risk from water that has adjusted fluoride levels (such as in London), as very high levels of fluoride intake are required before skeletal fluorosis will develop. (1)

Also see…. Response # 19, Fluoride causes hip fractures

(1) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride. Page 25 - 29.

RESPONSE # 19 (MLHU)

- **Issue # 37 – Fluoride causes hip fractures**

The National Research Council review concluded that drinking water concentrations of 4 mg/L are likely to increase fracture rates compared with exposure to fluoride at 1 mg/L, particularly in some susceptible groups that are prone to accumulating fluoride into their bones (such as those with kidney problems) but no conclusions could be drawn about risk at 2 mg/L. (1)

A review was conducted in England of 29 studies that assessed the fracture risk of water fluoridated at levels closest to 1.0 mg/L compared to the lowest water fluoride level reported. The review concluded that, based on the best available evidence, fluoride was not associated with bone fractures. (2) An Australian review came to a similar conclusion, and stated "The authors of the three existing systematic review [sic] concur that water fluoridation at levels aimed at preventing dental caries has little effect on fracture risk – either protective or deleterious. (3)

(1) National Research Council Report. Page 7.
(2) McDonagh M, Whiting P, Bradley M et al. A Systematic Review of Water Fluoridation. 2000 NHS Centre for Reviews and Dissemination, University of York. Page 67. http://www.york.ac.uk/inst/crd/fluorid.htm , Accessed March 30, 2011.
(3) National Health and Medical Research Council. A Systematic Review of the Efficacy and Safety of Fluoridation. Part A: Review of Methodology and Results. 2007. Australian Government. Page 93. http://www.nhmrc.gov.au/publications/synopses/eh41syn.htm Accessed March 30, 2011.

RESPONSE # 20 (MLHU)

- **Issue # 38 – Fluoride causes cancer**

Many epidemiologic studies have been conducted to evaluate the relationship between fluoride in drinking water and cancer. A number of expert committees have reviewed these studies and concluded that there is no clear association between water fluoridation and cancer. (1) (2) This includes the recent Health Canada report which states "The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to **cancer**, immunotoxicity, reproductive/developmental toxicity, genotoxicity and/or neurotoxicity." (3)

At the January 25, 2012 Public Participation Meeting, the Civic Works committee was shown a video by Dr. Dean Burk based on a study conducted in the 1970s assessing cancer deaths in 20 American cities, which concluded that deaths in fluoridated cities was greater than in cities without fluoridated drinking water. (4) The National Cancer Institute reviewed this report and determined that investigations had failed to take into account the widely accepted risk factors known to affect the death rate for specific cancers. Ethnic composition of the population, geographic location, socioeconomic status, ages and sex differences had all been disregarded.

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(5) In addition, when the data from Dr. Burk's study were re-analyzed using standard procedures to account for these factors, the difference in cancer death rates was found to be due to the age and racial makeup of the respective populations. (6)

On October 12, 2011, an expert panel in California (California Proposition 65 Carcinogen Identification Committee) assessed whether fluoride should be added to a list of cancer causing agents, and based on a review of the evidence unanimously voted to not list fluoride as a carcinogen. (7)

(1) McDonagh M, Whiting P, Bradley M et al. A Systematic Review of Water Fluoridation. 2000 NHS Centre for Reviews and Dissemination, University of York. Page 67. http://www.york.ac.uk/inst/crd/fluorid.htm , Accessed March 30, 2011
(2) National Health and Medical Research Council. A Systematic Review of the Efficacy and Safety of Fluoridation. Part A: Review of Methodology and Results. 2007. Australian Government. Page 93. http://www.nhmrc.gov.au/publications/synopses/eh41syn.htm
(3) Health Canada Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride. Page 1
(4) Yiamouylannis J and Burk D. Fluoridation and cancer: age-dependence of cancer mortality related to artificial fluoridation. Fluoride 1977, 10:102-23.
(5) Hoover RN, McKay FW and Fraumeni JR. Fluoridated drinking water and the occurrence of cancer. J Natl Cancer Inst, 1976; 57:757-768.
(6) Doll R and Kinlen L. Fluoridation of water and cancer mortality in the U.S.A. Lancet 1977, i:1300-1303.
(7) Consumer Health Care Products Association http://www.chpa-info.org/issues/Fluoride_.aspx ; Accessed January 22, 2012

RESPONSE # 21 (MLHU)

- **Issue # 39 – Fluoride causes osteosarcoma**

Osteosarcoma is a rare form of bone cancer. The concern about osteosarcoma in relation to fluoride arose from one animal study that found that male rats given very high doses of fluoride (100 - 175 mg/L) in their drinking water had a small increased risk of developing osteosarcoma compared to control rats. This effect was not seen in two other studies involving rats exposed to fluoride, although a study in mice showed an increase in noncancerous bone tumours at very high fluoride doses. (1)

Many human studies have been performed with regard to cancer and fluoride. Most show no risk of cancer, including osteosarcoma; however, a few suggest an association between osteosarcoma and fluoride, including a PhD research study which found an association between osteosarcoma and fluoride levels in boys, based on the fluoride levels they were exposed to at younger ages when bones were growing. (2) The National Research Council report describes this study as having "important strengths and major deficits." (3) A more recent study looked at fluoride levels in the bone adjacent to osteosarcoma and did not demonstrate an association between fluoride levels in bone and osteosarcoma. (4)

Also see…. Response # 20, Fluoride causes cancer

(1) National Research Council Report. Pages 316-320; Table 10-2.
(2) Bassin EB, Wypij D, Davis RB et al. Age-specific fluoride exposure in drinking water and osteosarcoma (United States). Cancer Causes Control. 2006;17.421-428.
(3) National Research Council Report. Page 328.
(4) Kim FM et al. Journal of Dental Research, October 2011; 90(10):1171-1176.

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RESPONSE # 22 (MLHU)

- **Issue # 40 - Fluoride causes decreased body weight**

Based on the National Research Council report and the review by Health Canada, a few animal studies suggested decreased body weight when animals are fed very high doses of fluoride. (1) (2) No human studies reporting this finding can be found in these reviews.

(1) National Research Council Report. Pages 185, 319, 476
(2) Health Canada. Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride. Pages 40, 50

RESPONSE # 23 (MLHU)

- **Issue # 41 – Fluoride causes autism**

There is no mention of an association between fluoride and autism in either the National Research Council report or the Health Canada report, two of the more recent fluoride reviews. (1) (2)

(1) National Research Council Report.
(2) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride.

RESPONSE # 24 (MLHU)

- **Issue # 42 - Fluoride cause hyperactivity**.

There is no mention of an association between fluoride and hyperactivity in either the National Research Council report or the Health Canada report, two of the more recent fluoride reviews. (1) (2)

(1) National Research Council Report.
(2) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride

RESPONSE # 25 (MLHU)

- **Issue # 43 - Fluoride causes learning disabilities**

There is no mention of an association between fluoride and learning disabilities in either the National Research Council report or the Health Canada report, two of the more recent fluoride reviews. (1) (2)

(1) National Research Council Report.
(2) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride

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RESPONSE # 26 (MLHU)

- **Issue # 44 - Fluoride causes cardiovascular disease**

There is no mention of an association between fluoride and cardiovascular disease in either the National Research Council report or the Health Canada report, two of the more recent fluoride reviews. (1) (2) A recent study that discusses a diagnostic scan that uses a fluoride tracer to detect blockages in the heart (atherosclerosis) has nothing to do with fluoride as a cause of heart disease. (3)

(1) National Research Council Report.
(2) Health Canada. Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride
(3) Li Y, Gholam B, Wisam S et al. Association of vascular fluoride uptake with vascular calcification and coronary artery disease. Nuclear Medicine Communications; 2012; 33(1):14-20.

RESPONSE # 27 (MLHU)

- **Issue # 45 – Fluoride causes fluorosis**

Dental fluorosis occurs during tooth development, from birth to about 5 years of age, when higher than optimal levels of fluoride are ingested. After the enamel is completely formed, dental fluorosis cannot occur. Older children and adults are, therefore, not at risk for dental fluorosis. Dental fluorosis in its questionable, very mild, and mild forms has no effect on tooth function. These types of fluorosis are not readily noticeable and often require a trained dental professional to detect.

A 2006 study of fluorosis prevalence showed that in most areas of eastern Canada, including Ontario, the prevalence of all levels of dental fluorosis is quite low. According to the findings and recommendations from the Expert Panel Meeting on fluoride recently held in Canada, from a health perspective, there is no reason to be concerned about the actual prevalence of very mild and mild dental fluorosis in Canada. (1) The Canadian Health Measures Survey, which surveyed 1,070 Canadian children aged 6 to 11 years between 2007 and 2009, found no severe fluorosis, almost no moderate fluorosis and very little mild (4%) or very mild fluorosis (12%). (2)

(1) Health Canada (2008) Findings and recommendations of the Fluoride Expert Panel Meeting. Water, Air and Climate Change Bureau, Safe Environments Programme, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa.
(2) Health Canada, Summary of the Oral Health Component of the Canada Health Measures Survey 2007 – 2009. Minister of Health, 2010. Summary Report Page 14 www.fptdwg.ca/English/e-documents.html , Accessed March 17, 2012.

RESPONSE # 28 (MLHU)

- **Issue # 46 – Fluoride causes lowered IQ**

Several studies have assessed IQ and fluoride levels, all from developing countries, most commonly China. (1) Studies that compare the IQ levels in rural villages are problematic because it is difficult to know if the differences in IQ are true findings or if they are related to problems with how the studies were conducted, or other unrecognized, unmeasured exposures. For example, IQ is known to be influenced by thyroid function and lead exposure. Very few of the fluoride studies assess these other exposures that may impact IQ. (2) (3)

Even if the findings of fluoride and IQ were accurate, the average fluoride levels in drinking-water in these studies were approximately three to five times higher than in London's drinking water, and the applicability of findings in rural villages in developing countries (mainly Chinese villages) to cities in developed countries is unknown. No studies looking at IQ levels in developed countries related to fluoride exposure appear to have been conducted.

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Health Canada's report stated "… the weight of evidence does not support a link between fluoride and intelligence quotient deficit, as there are significant concerns regarding the available studies, including quality, credibility, and methodological weaknesses. These conclusions are in agreement with the findings and recommendations of the 2007 Expert Panel Meeting on fluoride held in Canada (Health Canada, 2008)." (4)

(1) National Research Council Report. Pages 205-208.
(2) Xiang Q., Liang Y., Chen L. et al. Effects of fluoride in drinking water on children's intelligence. Fluoride 2003;36(2):84-94. As quoted in the National Research Council report. Page 205.
(3) Xiang Q., Liang Y, Zhou M et al. Blood lead of children in Wamiao-Xinhuai intelligence study (letter). Fluoride 2003;36(3):198-199. As quoted in the National Research Council report. Page 206.
(4) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride. Page 63.

RESPONSE # 29 (MLHU)

- **Issue # 47 - Fluoride damages the pineal gland**

The pineal gland is a small organ located near the centre of the brain. It produces a hormone called melatonin which is involved in the sleep-wake cycle and the onset of puberty and menopause. The National Research Council report reviewed the few studies (one animal and two human studies) that assess fluoride in relation to the pineal gland and found no evidence that fluoride damages the pineal gland and very little evidence that fluoride has any effect on the functioning of the pineal gland aside from one study in gerbils fed very high amounts of fluoride. (1) The gerbil study is also reviewed in the Health Canada report. (2)

(1) National Research Council Report. Page 252-256
(2) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride. Page 63.

RESPONSE # 30 (MLHU)

- **Issue # 48 - Fluoride causes birth defects**
- **Issue # 49 - Fluoride causes reproductive problems**

The most studied birth defect is Down's syndrome. A review of the literature conducted in 2001 stated that an association between water fluoride concentrations and Down's syndrome was inconclusive. (1) Overall, the National Research Council report concluded that "studies of fluoride's effects on human development are few and have some significant shortcomings in design and power, limiting their impact". (2) The reports also states "A few studies of human populations have suggested that fluoride might be associated with alterations in reproductive hormones, fertility, and Down's syndrome, but their design limitations make them of little value for risk evaluation." (3) Furthermore, Health Canada concludes that "The weight of evidence from all currently available studies does not support a link between exposure to fluoride in drinking water at 1.5 mg/L and any adverse health effects, including those related to cancer, immunotoxicity, **reproductive/developmental toxicity**, genotoxicity and/or neurotoxicity." (4)

(1) Whiting P, McDonagh M and Kleijnen J. Association of Down's syndrome and water fluoride level: a systematic review of the evidence. BMC Public Health (2001)1:6.
(2) National Research Council Report. Page 203-204.
(3) National Research Council Report. Page 204.
(4) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride. Page 1.

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RESPONSE # 31 (MLHU)

- **Issue # 50 – Fluoride causes stomach problems**

The National Research Council report and Health Canada report both do not provide any convincing human evidence that fluoride at levels used in London cause gastrointestinal / stomach problems. These reviews indicated that gastrointestinal / stomach problems occur at significantly higher levels of fluoride exposure than would result from adjusted fluoride in London's drinking water. (1) (2)

(1) Health Canada. Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride. Page 30.
(2) National Research Council Report. Pages 268-274

RESPONSE # 32 (MLHU)

- **Issue # 51 - Fluoride causes unspecified health problems**
- **Issue # 52 - The City of London does not reveal the true cost of fluoridation because it does not include the costs incurred due to the health problems caused**

The safety of fluoride has been reviewed in several recent systematic reviews performed in a variety of countries including England (1), Australia (2), the United States (3) and Canada. (4) The only documented adverse effect from exposure to the low levels of fluoride used in adjusted drinking-water is dental fluorosis. In Canada, where the recommended level for adjusted fluoride is 0.7 mg/L., very little dental fluorosis occurs. The Canadian Health Measures Survey, which surveyed 1,070 Canadian children aged 6 to 11 years between 2007 and 2009, found no severe fluorosis, almost no moderate fluorosis and very little mild (4%) or very mild fluorosis (12%). (5)

(1) McDonagh M, Whiting P, Bradley M et al. A Systematic Review of Water Fluoridation. 2000 NHS Centre for Reviews and Dissemination, University of York. Page 67. http://www.york.ac.uk/inst/crd/fluorid.htm , Accessed March 30, 2011
(2) National Health and Medical Research Council. A Systematic Review of the Efficacy and Safety of Fluoridation. Part A: Review of Methodology and Results. 2007. Australian Government. Page 93. http://www.nhmrc.gov.au/publications/synopses/eh41syn.htm
(3) National Research Council Report
(4) Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride.
(5) Health Canada, Summary of the Oral Health Component of the Canada Health Measures Survey 2007 – 2009. Minister of Health, 2010. Summary Report Page 14 www.fptdwg.ca/English/e-documents.html , Accessed March 17, 2012.

RESPONSE # 33 (MLHU)

- **Issue # 53 - Some children are allergic to fluoride which can cause depression**

There is no evidence in the Health Canada report or the National Research Council report that people can be allergic to fluoride or that fluoride causes depression. (1) (2) At the Public Participation Meeting on January 25, 2012, the Civic Works Committee was shown a video of a crying girl who is reported to be taking fluoride supplements and had a brain allergy to fluoride. The girl then became happier after reportedly taking a different dilution of fluoride supplements. This video clearly does not provide any convincing evidence of an association between fluoride and allergy or depression.

(1) National Research Council Report Page 293 for allergy information
(2) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride.

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RESPONSE # 34 (MLHU)

- **Issue # 54 - Some segments of population are hyper-sensitive to fluoride**

Hyper-sensitive is a term that is generally synonymous with “allergic”. There is no evidence in the Health Canada report or the National Research Council report that people can be allergic to fluoride. (1) (2)

(1) National Research Council Report. Page 293
(2) Health Canada. Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride.

RESPONSE # 35 (MLHU)

- **Issue # 55 - The kidneys of young children and the elderly cannot properly excrete fluoride**

There is no evidence that either the young or the elderly have difficulties excreting fluoride. The level of fluoride considered acceptable was determined based on those who are most susceptible to dental fluorosis (children 1-4 years of age). Levels of daily intake are calculated for all age groups in the Health Canada report and are near or below the tolerable daily intake for all ages at 1.0 mg/L and therefore would be below the tolerable daily intake at the 0.7 mg/L used in London. (1) These levels result in no severe fluorosis, almost no moderate fluorosis and very little mild (4%) or very mild fluorosis (12%) in Canadian children based on the Canadian Health Measures Survey. (2)

(1) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride 2010, Pages 94 and 95
(2) Health Canada, Summary of the Oral Health Component of the Canada Health Measures Survey 2007 – 2009. Minister of Health, 2010. Summary Report Page 14 www.fptdwg.ca/English/e-documents.html , Accessed March 17, 2012.

RESPONSE # 36 (MLHU)

- **Issue # 56 - Native Americans, Latin Americans and African Americans have higher rates of diabetes and kidney disease and are therefore more susceptible to harm from fluoridated water**

There is no mention in either the Health Canada report or the National Research Council report of an increased susceptibility to harm from fluoride in Native American, Latin Americans, African Americans or Aboriginal people. (1) (2)

The relationship between diabetes and the intake of water and fluoride is discussed in Response # 6.

People with kidney problems may retain more fluoride. The National Research Council report indicates that in communities where fluoride levels in drinking water are 4.0 mg/L there may be an increased risk of fractures or other effects in people with kidney problems. (3) As this level of fluoride is more than 5 times the level in London’s drinking water, fluoride levels in London are not expected to be of concern for people with kidney problems in London. Fluoridated water should not be used in dialysis equipment because of the potential to accumulate large amounts of fluoride through this process.

(1) National Research Council Report.
(2) Health Canada, Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Fluoride.
(3) National Research Council Report. Pages 7 and 9

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RESPONSE # 37 (MLHU)

- **Issue # 57 - Latin Americans and African Americans have higher rates of fluorosis and are therefore more susceptible to harm from fluoridated water**

Some studies have shown than Latin Americans and African Americans have higher rates of fluorosis; however, there is no evidence to show that this is due to an increased susceptibility to the fluoride in Canadian drinking water.

The U.S. Centers for Disease Control and Prevention, Division of Oral Health has responded to this issue by stating, "[…] there is no scientific evidence that exposure to fluoride at the levels found in optimally fluoridated water present any risk for the development of any disease processes. Neither is there any evidence that certain individuals or subgroups of individuals… suffer any adverse effects from drinking fluoridated water. The preponderance of scientific evidence indicates that fluoridation of community water supplies is both safe and effective." (1)

(1) Centers for Disease Control and Prevention, Division of Oral Health. Facts on the ATSDR Toxicological Profile for Fluorides, Hydrogen Fluoride, and Fluoride. US Department of Health and Human Services, 1998.

RESPONSE # 38 (MLHU)

- **Issue # 58 - Fluoride is absorbed through the skin during showers/baths**

Human skin serves an important role by protecting us from external factors in the environment. Each skin cell is surrounded by a protective cell membrane composed largely of fatty compounds known as lipids. These cell membranes are particularly adept at resisting penetration by water molecules and electrically-charged atoms (or ions) dissolved in water, such as fluoride ions. (1) This is why our bodies don't absorb water through our skin. It is also the reason that our bodies don't absorb salts or other ionic compounds when we swim in the ocean. Seawater, in addition to numerous other salts, has a fluoride concentration of approximately 1.3 mg/L, or about double the amount of fluoride in London tap water. (2)

A review of the primary literature found no studies on the topic of dermal (skin) absorption of fluoride from fluoridated water. Papers looking at exposure routes for fluoride primarily focus on ingestion. The major cited routes of fluoride exposure are the consumption of water, beverages and foods (including those that are processed or made with fluoridated water), and the ingestion of dental products such as fluoridated toothpaste. (3) (4)

Similarly, the Scientific Committee on Health and Environmental Risk (SCHER) found that no experimental data exists on the dermal absorption of fluoride from water. They also suggest that because fluoride is an ion, it is not expected to be absorbed through the skin when in a water solution with near neutral pH. (5)

Another possible exposure pathway when showing or bathing is inhalation. No studies on the inhalation of fluoride from showering or bathing were found. SCHER states that this exposure pathway is unlikely to contribute significantly to the body burden of fluoride in the general population (5).

(1) Klaassen C D. Casarett & Doull's Toxicology: The Basic Science of Poisons. 7th ed. McGraw-Hill; 2008
(2) Dobbs, G.G. 1974. Fluoride and the environment. Fluoride 7:123–135.
(3) Agency for Toxic Substances & Disease Registry (ATSDR). Toxic Substances Portal – Fluorine, Hydrogen Fluoride, and Fluorides. Available from: http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=212&tid=38
(4) Erdal S, Buchanan S N. quantitative Look at Fluorosis, Fluoride Exposure, and Intake in Children Using a Health Risk Assessment Approach. Environmental Health Perspectives. 2005; 113(1): 111-117
(5) Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. Brussels: European Commission, Directorate C, Public Health and Risk Assessment. 2010. Available from: http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_139.pdf

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RESPONSE # 39 (MLHU)

- **Issue # 59 - Studies have shown that fluoridated water delays tooth eruption, so it simply delays tooth decay**

A handful of articles, the majority of which were published prior to 1977, suggested that exposure to high fluoride concentrations in drinking water delays tooth eruption (2) (3) (4) (5). Other researchers have disagreed, concluding that there was no effect of systemic fluorides on permanent tooth emergence. (6) (7) (8) In 2003, a statistically rigorous study (9) was designed to investigate this claim further. The researchers concluded that the impact of fluoride exposure was “sometimes observed, but if existing, it was minimal.” (9)

(1) Leroy et al. The effect of fluorides and caries in primary teeth on permanent tooth emergence. Community Dent Oral Epidemiology, 2003; 31: 463-470.
(2) Virtanen et al. Timing of eruption of permanent teeth: standard Finnish patient documents. Community Dent Oral Epidemiol 1994; 22: 286-288.
(3) Ainsworth NJ. Mottled teeth. Br Dent J 1933; 55: 233-50.
(4) Feltman, Kosel. Prenatal and postnatal ingestion of fluorides – 14 years of investigation –final report. J Dent Med 1961;16:190-196.
(5) Bauer et al. Eruption of permanent teeth in regions with low and high fluoride content of drinking water. Osterr Z Stomatol 1974; 71:122-37.
(6) Kunzel W. Influence of water fluoridation on the eruption of permanent teeth. Caries Res 1976; 10:96-103.
(7) Dean. Chronic endemic dental fluorosis. J Am Med Assoc 1936; 107: 1269-72.
(8) Day M. Chronic endemic fluorosis in Northern India. Br Dent J 1940; 68: 409-24.
(9) Carlos, JP et al. Longitudinal studies of the natural history of caries. Part I. Eruption patterns of the permanent teeth. J Dent Res 1965; 44: 509-16.

RESPONSE # 40 (MLHU)

- **Issue # 60 - Systematic reviews are not a substitute for peer-reviewed toxicological studies**

A systematic review is a research summary of **all evidence** that relates to a particular question**, including** relevant, peer-reviewed, toxicological studies. The question could be one of intervention effectiveness, causation, diagnosis or prognosis. The systematic review process follows a rigorous methodology for searching, retrieval, relevance and quality rating, data extraction, data synthesis and interpretation. (1) A systematic review may incorporate peer-reviewed toxicological studies if the research quality is acceptable and answers the questions being investigated.

(1) Cullum, N., Ciliska, D., Haynes, R.B., & Marks, S. (2008). *Evidence-Based Nursing. An Introduction*. Oxford: Blackwell

RESPONSE # 41 (MLHU)

- **Issue # 61 - Cavities are not caused by a fluoride deficiency; they are caused by modern diets**

This first half of this statement is correct; dental caries is not caused by a fluoride deficiency. Caries is caused by the intersection of several factors, as illustrated in Figure 1 at the top of the next page. At the core, caries results when oral bacteria grow on teeth and use food debris left in the mouth to produce acid that degrades tooth surfaces. This process is affected by “numerous co-contributing factors, including lifestyle and human behaviour parameters.” (1) Because the disease is multi-factorial, it is unlikely that changing diet alone will prevent cavities.

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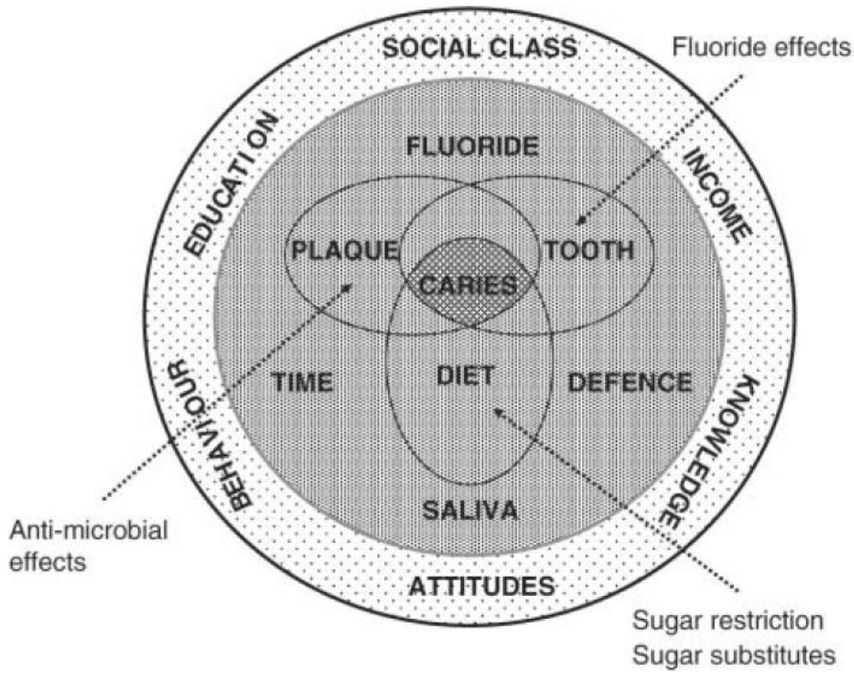

Figure 1. Modified Keyes diagram of factors determining caries development.

(1) Cate. The need for antibacterial approaches to improve caries control. Adv Dent Res, 2009; 21:8-12

RESPONSE # 42 (Administration)

- **Issue # 62 – Doctors and scientists have been wrong before**

It is correct that throughout the history of scientific endeavour, incorrect conclusions have been drawn. We know this to be true because scientific methodology has revealed these errors. Such errors can be made through the neglect of accepted scientific methods, or as a result of an identifiable weakness in the accepted scientific methodology. In the case of the latter, root cause analysis is performed to identify and correct the methodological weakness so that similar errors are avoided in the future. Through this process, the scientific method constantly evolves and improves.

Current scientific methodology is our most effective tool to improve or verify our understanding of natural phenomena. It is for this reason that scientists value the process of publishing their findings in peer-reviewed academic journals. Through this process, new research is reviewed by recognized experts in the field, prior to publishing. These experts review the research methodology to ensure adherence to current scientific practices. Once published, the research findings are subject to review by the entire scientific community, who may challenge the conclusions drawn by using the same process of peer-reviewed research.

It is for these reasons that the Middlesex-London Health Unit looks to the existing peer-reviewed scientific literature when asked to evaluate a claim such as “fluoride causes autism”, or “fluoride causes diabetes”. If such a conclusion was published in a peer-reviewed scientific journal, this would lend substantial credence to the claim. But if such assertions are made without exposure to the peer-review process, then they cannot be considered to be supported by modern science.

In this report, Administration has recommended that Council affirm its confidence in the integrity and recommendations of the World Health Organization, Health Canada, Ontario’s Chief Medical Officer of Health, and the Medical Officer of Health for the Middlesex-London Health Unit. This recommendation is based upon the understanding that these individuals and organizations are committed to making decisions and recommendations based upon current

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scientific evidence. It is important to note that a recommendation based on scientific evidence can change in the future, based on new, peer-reviewed evidence. If the agencies listed above alter their recommendation in the future with respect to drinking-water fluoridation, Administration will provide that information to Council, so that the best evidence-based decisions can be made.

RESPONSE # 43 (MLHU)

- **Issue # 63 - The York review concluded that water fluoridation is not safe nor could be concluded to be cost-effective**

The York review is a comprehensive systematic review conducted by the University of York in the United Kingdom: it was published in 2000.The aim of the York Review was to assess the evidence on the positive and negative effects of population wide drinking water fluoridation strategies to prevent caries. To achieve this aim, five objectives were identified:

- **Objective 1:** What are the effects of fluoridation of drinking water supplies on the incidence of caries?
- **Objective 2:** If water fluoridation is shown to have beneficial effects, what is the effect over and above that offered by the use of alternative interventions and strategies?
- **Objective 3:** Does water fluoridation result in a reduction of caries across social groups and between geographical locations, bringing equity?
- **Objective 4:** Does water fluoridation have negative effects?
- **Objective 5:** Are there differences in the effects of natural and artificial water fluoridation?

1. The York Review was not asked to determine if water fluoridation was cost effective.

2. The York Review did review potential adverse health effects. The review concluded that dental fluorosis may be present and cause an “aesthetic concern”. There was no clear association between bone fracture/developmental problems and water fluoridation. Also, no clear association between water fluoridation and incidence or mortality of bone cancers, thyroid cancer or all cancers was found. However, the studies examining other possible adverse effects provided insufficient evidence regarding any particular outcome to permit confident conclusions. Further research in these areas needs to be of a much higher quality and should address and use appropriate methods to control for confounding variables. (1)

It should be noted that the York review was published in 2000, and there have been other, more recent, reviews that have examined new research.

(1) Center for Reviews and Disseminations. *Fluoridation of Drinking Water: A Systematic Review of its Efficacy and Safety.* York, UK: University of York, 2000.

RESPONSE # 44 (Administration)

- **Issue # 64 - Toothpaste tubes contain a warning to call poison control if you swallow it - therefore fluoride is toxic**

The question of whether a substance is toxic, or not, is dependent upon the dosage of the substance ingested. It is a well known principle of biology that beneficial effects can result from exposure to low doses of a substance, whereas the same substance can be toxic when given at higher doses. For example, the air that we breathe is comprised of about 20% oxygen; but oxygen is toxic to humans at high concentrations. Another example is vitamin and mineral supplements; though vitamins and minerals are essential to human life, high doses can be toxic or fatal. It is not uncommon for unattended children to over-consume vitamin supplements, and it is important to seek medical attention if this occurs.

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Very high doses of fluoride should also be avoided. Some children will eat toothpaste straight from the tube; in the U.S., toothpaste tubes contain a warning that if **more than** the amount used for brushing is swallowed, then Poison Control should be called to provide guidance. This warning is not found on toothpaste tubes in Canada.

If a Poison Control centre is contacted regarding the ingestion of toothpaste, they will ask about the amount of toothpaste consumed, e.g. a small squirt, or an entire tube. The guidance provided by the Poison Control centre depends upon this information. Administration contacted the Vice-President of the Canadian Association of Poison Control Centres and asked how they would advise someone who called to report that a child had eaten toothpaste. The following response was provided:

"It is the mandate of every poison centre to offer treatment advice in the event of exposure to fluoride in its many different forms. This an example of one of the guidelines used at one of our Canadian Poison Centres;

Acute Ingestion:
Ingestion of dental products in children may cause mild stomach upset. Systemic toxicity is rare.

Toxic dose*:*
Self-limiting gastrointestinal symptoms may occur following ingestion of up to 8 mg/kg (mg of fluoride per kg of body weight) of elemental fluoride in dental products. Ingestion of ≥ 8 mg/kg elemental fluoride may result in systemic symptoms.

In essence it would usually take a large amount of toothpaste to cause acute toxicity in a child.

As you are aware, at the current recommended fluoridation levels of 0.7 mg/L in Canadian water, 8 mg/kg works out to be 11.4 L of water per kg of body weight.

Regarding the U.S. labelling requirement to call a Poison Control center, the US Code of Federal Regulations requires generic warnings on labels for all over-the-counter drugs "which are generally recognised as safe and effective…" The fluoride label is a variant of this generic warning; of course, the general warnings are not a gauge of inherent danger or toxicity."

RESPONSE # 45 (Administration)

- **Issue #65 – The Hazardous Waste Act does not permit HFSA to be added to the environment, yet we return our tap water to the Thames River**
- **Issue # 66 – Since it is illegal to dump HFSA in the environment, why is it okay to add it to drinking water?**
- **Issue # 67 – It is illegal to discharge fluoridated water to the environment**
- **Issue # 68 – Environment Canada has a Fluoride Guideline of 0.12 mg/L for water discharged to the environment**
- **Issue # 69 – Fluoride in our water causes unspecified "harm to the environment"**

There is no "Hazardous Waste Act" in Canada, and HFSA is not defined as a hazardous waste by Canadian legislation, such as the Canadian Environmental Protection Act, 1999. HFSA is a product that the City of London purchases and uses for a specific purpose; as such, it does not meet the definition of a waste product.

The HFSA that London purchases is a concentrated acid that is diluted in an approximate ratio of 1:450,000 in our drinking-water. In its concentrated state, it is a corrosive acid, and it would certainly be illegal to discharge it to the environment. However, as stated earlier, when the HFSA is diluted into drinking-water, the HFSA molecules become completely dissociated; that is, by interacting with water molecules, the ions (predominantly fluoride) that make up the HFSA separate from each other and disperse into the water. Because of this dissociation, the HFSA that is added to the water actually ceases to exist as HFSA. People do not ingest, and are not exposed to HFSA when they drink fluoridated water. Similarly, no HFSA exists in the tap water that we return to the environment.

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The Thames River, the Great Lakes, and all natural water sources contain fluoride ions. Although fluoride ions are always present in natural water sources, very high levels of fluoride can be harmful to the aquatic environment. In 1999, the Canadian Council of Ministers of the Environment (CCME) established an **Interim** Guideline (1) for total inorganic fluorides of 0.12 mg/L. Interim Guidelines are defined as follows:

"interim guideline: *For sediment, water, and tissue residue guidelines: a guideline value derived from a data set that has met a lesser CCME requirement than that of a full guideline. Once data gaps are addressed by the scientific community, a full guideline may be derived."*

As of 2012, a full guideline has not been derived.

In Ontario, the MOE regulates discharges to the environment, and London's wastewater treatment plants must meet the MOE's Provincial Water Quality Objectives, which are established to ensure that the water quality is satisfactory for aquatic life and recreation. There is no Ontario Provincial Water Quality Objective for fluoride.

The province of British Columbia however, has established "Ambient Water Quality Criteria for Fluoride". (2) The overview report that established BC's fluoride criteria notes that *"The main sources of fluoride contamination in BC are the Alcan aluminum smelter in Kitimat and the Cominco fertilizer plants in Trail and Kimberley"* The report also notes that *"Most fish are much less sensitive to fluoride than are trout or salmon", a*nd that the fluoride criteria *"is designed for soft, coastal waters where* Oncorhynchus *species* (Pacific Salmon and Trout*)* reproduce".

The BC criteria states that *"The total fluoride concentration of fresh waters should not exceed 0.4 mg/L when hardness is 10 mg/L, otherwise use the equation: LC_{50} fluoride = -51.73 + 92.57 Log_{10} (Hardness) and multiply by 0.01".* In other words, for very soft water any discharges must not raise the total fluoride concentration of the natural water above 0.4 mg/L. Since water hardness negates the effects of fluoride ions, they provide a formula to calculate the criteria for harder water.

London's drinking water is fluoridated to a target value of 0.7 mg/L. When water goes down our drains, it mixes and dilutes with the groundwater that also enters our sanitary sewer system. City staff have measured the fluoride content of the effluent water at the Greenway Pollution Control Plant before it is discharged to the Thames River, and found the average fluoride content to be 0.37 mg/L. So, even before this water is greatly diluted by the Thames itself, the fluoride content is below the stringent 0.4 mg/L BC criteria for very soft water.

However, the water in the Thames River is not "very soft water"; it's very hard, generally between 200 and 300 mg/L by Ministry of Environment (MOE) measurement. Using an average hardness of 250 mg/L, the BC formula provides a criteria value of 1.7 mg/L. That is, the BC criteria that was designed to protect the highly sensitive Pacific Salmon and Trout, would allow for a fluoride concentration in the Thames water of 1.7 mg/L; a value that is much higher than could result from the discharge of fluoridated drinking-water. Again, the BC criteria were designed to regulate industrial waste discharges to natural waterways.

In 2004, a paper titled "Water Fluoridation and the Environment: Current Perspective in the United States" was published in The International Journal of Occupational and Environmental Health. (3) In the paper, *"Evidence of water fluoridation's effects on plants, animals, and humans is considered based on reviews by scientific groups and individual communities".* The following is reproduced from the paper's conclusions:

"There appears to be no concern about the environmental aspects of water fluoridation among those experts who have investigated the matter."

In 2011, the European Commission's Scientific Committee on Health and Environmental Risks (SCHER) published a report titled *"Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water".* (4)

Among the conclusions of the SCHER report is the following:

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"Based on three lines of evidence, a simplistic risk assessment, mass balance modelling and a modified EUSES analysis, SCHER is of the opinion that adding fluoride to drinking water at concentrations between 0.8 mg F-/L and the reference dose level of WHO (1.5 mg F-/L) does not result in unacceptable risk to water organisms."

It should be noted that the City of London fluoridates to a concentration of 0.7 mg/L, which is lower than the range of fluoride concentrations that SCHER evaluated.

(1) Canadian Council of Ministers of the Environment. 2002. Canadian water quality guidelines for the protection of aquatic life: Inorganic fluorides. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.
(2) http://www.env.gov.bc.ca/wat/wq/BCguidelines/fluoride/fluoridetoo-04.html
(3) Pollick, H. Water Fluoridation and the Environment: Current Perspective in the United States. INT J OCCUP ENVIRON HEALTH 2004;10:343–350
(4) Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. May, 2011.

RESPONSE # 46 (Administration/MLHU)

- **Issue # 70 - Discontinuation of fluoridation would save taxpayers money**

Administration has estimated that that the fluoridation of London's water costs approximately $133,000 per year, or about 38 cents per London resident per year. As noted earlier in this report, on February 17, 2011, the Board of Health for the Middlesex-London Health Unit (MLHU) received a staff report recommending that the Board of Health *"…support the ongoing fluoridation of the City of London's drinking water supply as a measure to achieve optimal dental/oral health for all residents, which is an important component of total health."* (reproduced as Appendix 'C'). The MLHU report reviewed the history of water fluoridation and current practices in the City of London, and discussed the safety and effectiveness of water fluoridation. The report noted estimates that for every $1 invested in community water fluoridation, $38 in dental treatment costs are avoided.

RESPONSE # 47 (Administration)

- **Issue # 71 – Fluoride increases lead levels in water by leaching lead from plumbing**

In 2000, U.S. E.P.A. researchers concluded that there is no "credible evidence" that water fluoridation has any quantifiable effect on the solubility, bioavailability or bioaccumulation of any kind of lead. (1)

Lead is released into water due to the corrosion of lead pipes and lead-containing plumbing materials, such as brass and solder. In 2004, a paper titled "Water Fluoridation and the Environment: Current Perspective in the United States" was published in The International Journal of Occupational and Environmental Health. (2) In the paper, the issue of fluoride and lead release is addressed as follows: *"According to the U.S. Environmental Protection Agency and the National Association of Corrosion Engineers, corrosion is not related to fluoride. Corrosion by potable water is primarily caused by dissolved oxygen, pH, water temperature, alkalinity, hardness, salt, hydrogen sulfide, and certain bacteria. Fluoride, at concentrations found in potable water, does not cause corrosion. A small increase in the corrosivity of potable water that is already corrosive may occur after treatment with alum, chlorine, fluorosilicic acid, or sodium silicofluoride, which decreases pH. This may occur in some potable water sources with little buffering capacity; it can easily be resolved by adjusting the pH upward."*

It should be noted that the pH of the City of London water is upwardly adjusted to minimize lead corrosion.

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In 2011, the European Commission's Scientific Committee on Health and Environmental Risks (SCHER) published a report titled *"Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water".* (3)

The SCHER report states that: *"It has been claimed that fluoridated drinking water increases human exposure to lead due to solubilisation of lead from drinking water pipes by formation of highly soluble lead complexes. The claim was based on relationships of drinking water fluoridation and blood lead concentrations observed in a case study (Coplan et al. 2007).Based on the available chemistry of fluoride in solution, the chemistry of lead and lead ions, and the concentrations of fluoride in tap water, it is highly unlikely that there would be an increased release of lead from pipes due to hexafluorosilicic acid"* (also known as hydrofluorosilicic acid).

(1) Urbansky ET, Schock MR. Can fluoridation affect lead(II) in potable water? Hexafluorosilicate and fluoride equilibra in aqueous solution. Int J Environ Stud 2000;57:597-637.
(2) Pollick, H. Water Fluoridation and the Environment: Current Perspective in the United States. INT J OCCUP ENVIRON HEALTH 2004;10:343–350
(3) Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. May, 2011.

RESPONSE # 48 (Administration/MLHU)

- **Issue # 72 - Other Canadian cities have stopped fluoridating, so London should as well**

It is correct that some Canadian municipalities have recently decided to stop fluoridating their water, such as Calgary, AB, Moncton, NB, and Waterloo ON. It is also correct that in other Canadian municipalities the decision has recently been made to re-affirm their support for water fluoridation, such as Cape Breton Nova Scotia, and the Ontario municipalities of the Region of Halton, the Region of Peel, Toronto, Hamilton, Sarnia, Norfolk, Atikokan and Tottenham.

As reported earlier, community water fluoridation in Dorval, QC was discontinued in 2003. In the 2-year period that followed, the percentage of kindergarten children at high risk of developing dental cavities doubled: rising from 8% to 17%. (1) In 2008, drinking-water fluoridation was re-introduced in Dorval.

In each of the decisions listed above, different local factors applied in each municipality; but in each case listed above, local, provincial and federal public health agencies expressed their support for drinking-water fluoridation.

(1) Levy, M. Update on Water Fluoridation in Quebec (French) from INSPQ Water fluoridation: An analysis of the health benefits and risk. 2007. 9e Quebec Public Health Meeting.

RESPONSE # 49 (MLHU)

- **Issue # 73 - There are other jurisdictions in Canada and around the world that do not fluoridate their water, so London shouldn't either**

The claim that fluoridation has been banned in other countries has been used often by opponents of fluoride. There are a number of countries that do not fluoridate their water supplies; however, this should not be misconstrued as concern over safety or effectiveness. Inaction is not synonymous with banning; some countries have simply not implemented a fluoridation system for a variety of technical, legal, financial or political reasons. (1)

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To illustrate:

1. France has not implemented communal water fluoridation due to distribution difficulties, but has implemented the fluoridation of milk and salt; in addition, approximately one million people in France drink water with a natural fluoride content of 0.7 ppm or more.

2. Although fluoridation is not practiced in Sweden and the Netherlands, both countries support the World Health Organization's (WHO) recommendations regarding fluoridation as a preventive health measure.

3. Switzerland, Germany, Mexico, Jamaica and Costa Rica receive benefits from salt fluoridation (1). In many parts of the world, fluoridation is not feasible for several reasons; lack of a central water supply, the presence of more urgent health needs and lack of sufficient funds for startup and maintenance costs (1).

Political decisions contrary to the recommendations of health authorities should not be interpreted as a negative response to water fluoridation; other factors affect political decisions.

Universal access to preventive dental treatment is not yet available in Ontario or Canada: therefore, we rely on community water fluoridation to aid in the prevention of dental decay.

(1) American Dental Association. *Fluoridation Facts.* Printed in US: 2005.

RESPONSE # 50 (Administration)

- **Issue # 74 - Fluoride is found in rat and cockroach poison**

Fluoride is the naturally occurring form of the element fluorine. The elements of the periodic table are the fundamental building blocks of all substances, much like the letters of the alphabet are the fundamental building blocks of all words. Just as different combinations of letters form different words, different combinations of elements form different substances. If a particular element is found within a particular substance, this does not imply that other substances containing that same element share all the characteristics of the first substance.

For example, the most common rat poisons are a family of anti-coagulant chemicals known as 4-Hydroxycoumarins. These chemicals are composed of the elements carbon, hydrogen and oxygen. The number of atoms of each constituent element, and the unique bonding and orientation of these elements, give the chemical its unique characteristics. It should not be deduced that carbon, hydrogen or oxygen should be avoided because they are found in rat poison.

RESPONSE # 51 (Administration)

- **Issue # 75 - The Material Safety Data Sheet for HFSA is missing key pieces of information, and states that HFSA is a carcinogen**

The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labelling of containers of WHMIS "controlled products", the provision of material safety data sheets (MSDSs) and worker education and training programs. MSDSs are readily obtainable from many sources.

At the January 25, 2012 Public Participation Meeting, one presenter provided slides which were identified as being reproduced from an MSDS for HFSA. The slide that was presented indicated that HFSA is listed as a "Group 3 Carcinogen", and in several other categories the required information was listed as "Not Available". However, there were several discrepancies between what was presented as being an HFSA MSDS, and the actual MSDS that is provided by the supplier of London's HFSA. These discrepancies are illustrated in the table below.

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MSDS Category	Jan 25/12 Slide Presentation	Actual MSDS for HFSA
Carcinogenicity Data	IARC group 3 Carcinogen (listed as **undefined**)	The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP. See "Other Studies Relevant to Material".
Respiratory / Skin Sensitization	Not Available	None known
Synergistic Materials	Not Available	None known
Reproductive Data	Not Available	No adverse reproductive effects are anticipated
Teratogenicity Data	Not Available	No adverse teratogenic effects are anticipated
Mutagenicity Data	Not Available	No adverse mutagenic effects are anticipated

It should be noted that the information listed on the MSDS for HFSA applies to HFSA in its concentrated form. This information is provided in the event that workers are accidentally exposed to concentrated HFSA, or if concentrated HFSA is accidentally released to the environment.

As has been noted previously in this report, when the HFSA is diluted into drinking-water, the HFSA molecules become completely dissociated; that is, by interacting with water molecules, the ions (predominantly fluoride) that make up the HFSA separate from each other and disperse into the water. Because of this dissociation, the HFSA that is added to the water actually ceases to exist as HFSA, and the information on the MSDS ceases to apply.

People do not ingest, and are not exposed to HFSA when they drink fluoridated water. Similarly, no HFSA exists in the tap water that we return to the environment.

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Appendix 'F'

Detailed Cost Calculations for the Three Alternatives Models of Fluoride Delivery that were Presented in Appendix E, Response # 2

Table A: Option 1: Topical Fluoride Applied in Public Health Unit-run Clinics		
	Unit Cost	**Program Cost**
Program Cost		
Population Size	152,789	
Number of Clinics	15	
Topical Fluoride	$2.37	
Number of Application of Topical Fluoride per Year	2	
Topical Fluoride Cost	$4.74	$724,217.58
Clinic Staff	60	
30 Dental Assistants	$44,292.00	$1,328,760.00
30 Dental Hygienists	$56,389.00	$1,691,670.00
Clinic Staff Benefits (20%)		$604,086.00
Clinic Operating Cost	$20,000.00	$300,000.00
Administrative Staff Salary	$44,292.00	
Administrative Staff Benefits (20%)	$8,858.40	
Administrative Staff	3	$159,451.20
Administrative Office Expenses		$9,450.00
Total Program Costs		**$4,817,634.78**
One-time Costs		
Administrative Office Setup		$15,000.00
Advertising Campaign	See Table D	$117,000.00
Database		$130,000.00
Capital (clinic setup costs)	$50,000.00	$750,000.00
TOTAL ONE-TIME COSTS		**$1,012,000.00**

Table B: Option 2: Topical Fluoride by Dental Professionals in Private Clinics		
	Unit Cost	**Program Cost**
Program Cost		
Population Size	152,789	
Visits per Year	2	
Fluoride and Application (twice per year)	$47.50	$14,514,909.40
Administrative Staff Salary	$44,292.00	
Administrative Staff Benefits (20%)	$8,858.40	
Administrative Staff	3	$159,451.20
Administrative Office Expenses		$9,450.00
Total Program Costs		**$14,683,810.60**
One-time Costs		
Administrative Office Setup		$15,000.00
Advertising Campaign	See Table D	$117,000.00
Database		$130,000.00
TOTAL ONE-TIME COSTS		**$262,000.00**

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Table C: Option 3: Mail Out Program		
	Unit Cost	**Program Cost**
Program Cost		
City of London Population	378,809	
Toothbrushes (every 3 months)	$0.31	$469,723.16
Toothpaste (every 3 months)	$2.00	$3,030,472.00
Distribution	$0.20	$29,105.00
Inserts	$0.20	$29,105.00
Stuffing	$0.10	$14,552.50
Administrative Staff Salary	$44,292.00	
Administrative Staff Benefits (20%)	$8,858.40	
Administrative Staff	3	$159,451.20
Travel		$5,000.00
Administrative Office Expenses		$9,450.00
Total Program Costs		**$3,746,858.86**
One-time Costs		
Administrative Office Setup		$15,000.00
Advertising Campaign	See Table D	$117,000.00
TOTAL ONE-TIME COSTS		**$132,000.00**

Table D: Advertising Campaign	
Market Research	$20,000
Brochure Mail-Out	$60,000
Print	$2,000
Radio	$5,000
Television	$5,000
Production Costs	$15,000
Evaluation Costs	$10,000
Total Advertising Cost	**$117,000**

APPENDIX N

MINISTER OF HEALTH RESPONSE TO REGION OF PEEL

HE-B1-1

Minister of Health | Ministre de la Santé

Ottawa, Canada K1A 0K9

APR 04 2012

Regional Municipality of Peel
Office of the Regional Chair

APR 17 2012

RECEIVED

Mr. Emil Kolb
Regional Chair and Chief Executive Officer
Regional Municipality of Peel
10 Peel Centre Drive
Brampton, Ontario L6T 4B9

Dear Mr. Kolb:

Thank you for your correspondence of February 6, 2012, concerning Peel Regional Council's resolution to request that Health Canada regulate fluorosilicates (i.e., hexafluorosilicic acid and sodium silicofluoride) as drugs under the *Food and Drugs Act*. I regret the delay in responding.

In Canada, responsibility regarding the safety of drinking water generally lies with the provincial and territorial governments. Health Canada worked with the provinces and territories, through the Federal-Provincial-Territorial Committee on Drinking Water, to develop the *Guidelines for Canadian Drinking Water Quality*. The provinces and territories use the Guidelines to establish their own requirements for drinking water quality and have sole responsibility regarding implementation. For that reason, your request that Health Canada regulate municipal drinking water supply treatment chemicals as drugs is an issue that falls outside the jurisdiction of the *Food and Drugs Act*.

With respect to your request regarding a long-term toxicology study, Health Canada recommends that drinking water treatment additives such as fluoridation agents be certified to the appropriate standard, specifically NSF/ANSI Standard 60: Drinking Water Treatment Chemicals - Health Effects. This standard requires a toxicology review of the product to ensure its safety at the maximum use level and to evaluate potential contaminants in the product.

Regarding human clinical evidence of the efficacy of adding fluoride to water supplies, most published scientific studies on the effectiveness of water fluoridation are based on comparisons between communities with minimal fluoride levels in the water supply versus communities with fluoridation, rather than a clinical intervention. The first controlled clinical trial at a community level was conducted in the U.S. and published in 1956; a recent human double-blind placebo-controlled clinical trial on how effectively fluoride is taken up from drinking water was conducted in the U.K. in 2005.

LEGISLATIVE SERVICES			
COPY TO:		FOR:	
Chair	✓	✓ Committee	
CAO	✓	✓	
Corporate Services		Council	
Public Works			
Employees and Business Services May 24/12 R.C.			
Health Services	✓	✓ File MOH	✓
Human Services			
Peel Living			

.../2

Canada

REFERRAL TO
RECOMMENDED
DIRECTION REQUIRED
RECEIPT RECOMMENDED ✓

The use of fluoride in the prevention of dental cavities continues to be endorsed by more than 90 national and international professional health organizations, including Health Canada. As dental disease is the number one chronic disease among children and adolescents in North America, water fluoridation is an important public health measure. The Department promotes and endorses the use of water fluoridation as a means of achieving good oral health through the prevention of cavities. Water fluoridation benefits all residents in a community, regardless of age, socioeconomic status, education, or employment or dental insurance status. I would like to clarify that the purpose of adding fluoride to water supplies is not to treat dental decay, which requires the intervention of a dentist, but to reduce the incidence of dental cavities.

Regarding your request for scientific studies specifically on the fluorosilicate compounds hydrofluorosilicic acid and sodium silicofluoride, these compounds break down in the municipal water supply to release fluoride ions. As a result, they are not found at the tap, which means that drinking water is not a source of exposure to these compounds.

Health Canada regulates fluoride in finished products for dental health care. These products contain sodium fluoride, sodium monofluorphosphate, acidulated phosphate fluoride, or stannous fluoride, not fluorosilicates. Each fluoride-containing dental health product must undergo a pre-market assessment of its quality, safety, and efficacy before it can receive a product licence authorizing its sale in Canada. Canadians have ready access to licensed fluoride dental health products that are effective in reducing the occurrence of dental caries and are not associated with any significant incidence of tooth mottling or other safety issues when used according to the recommended conditions of use.

Thank you for writing.

Sincerely,

Leona Aglukkaq

HE-B1-3

Office of the Chair

February 6, 2012 Resolution No. 2012-14

The Honourable Leona Aglukkaq
Minister of Health
House of Commons
Ottawa, ON K1A 0A6

Dear Minister Aglukkaq:

Subject: Fluoride Levels in Community Drinking Water and Toothpaste

---

I am writing to advise that Peel Regional Council approved the following resolution at its meeting held on January 12, 2012:

> "That the Region of Peel request that Health Canada regulate the fluorosilicates hexafluorosilicic acid (H2SiF6) and sodium silicofluoride (Na2SiF6), used as a treatment for dental cavities in drinking water, as drugs under the Food and Drugs Act;
>
> And further, that all chemicals, especially fluorosilicates, added to drinking water for the purpose of treating dental decay undergo new drug applications and be assigned drug numbers by Health Canada;
>
> And further, that classification of fluorosilicates as drugs shall be based on at least one long-term toxicology study to determine health effects in humans;
>
> And further, that at least one properly conducted, double blinded, randomized placebo controlled clinical trial be used to provide effectiveness as the basis for a new drug classification;
>
> And further, that the Region of Peel make the above recommendations to Health Canada to reassure the citizens of Peel that the use of fluorosilicates added to drinking water for the purpose of treating dental decay is safe and what the health effects are;
>
> And further, that a copy of this resolution be sent to the Federal and Provincial Minister of Health, and Peel area MPs and MPPs;
>
> And further, that Peel MPs and MPPs be requested to follow up on this issue with the Ministers of Health and report back to Regional Council with a response."

HE-B1-4

On behalf of Regional Council, I request that you give consideration to the above resolution as soon as possible. Please quote the Region of Peel's resolution number in your reply.

Sincerely,

Emil Kolb

Emil Kolb
Regional Chair and Chief Executive Officer

EK:tr

c: Janette Smith, Commissioner of Health
Dr. David Mowat, Medical Officer of Health

Also sent to:

Dr. Peter Cooney
Chief Dental Officer
Health Canada
A.L. 1501A, Tunney's Pasture
Ottawa, Ontario K1A OK9
Canada

The Honourable Deb Matthews
Minister of Health and Long-Term Care
10th Floor, Hepburn Block
80 Grosvenor Street
Toronto, Ontario M7A 2C4

Dr. Arlene King
Chief Medical Officer of Health
Public Health Division
11th Floor, Hepburn Block
Queen's Park
Toronto, Ontario M7A 1R3

Also Copied:

Eve Adams, MP – Mississauga-Brampton South
Stella Ambler, MP – Mississauga South
Brad Butt, MP – Mississauga-Streetsville
Bob Dechert, MP – Mississauga-Erindale
Parm Gill, MP – Brampton-Springdale
Bal Gosal, MP – Bramalea-Gore-Malton

APPENDIX M
SECOND PUBLIC FORUM MATERIAL

Fluoridation Public Forum

- Presentation on findings
- Address issues raised, including answers to questions from Feb 29th public forum
- Questions to the panel

Public Consultation Overview

- Background
- Objectives
- Recap of process
- Public presentation of findings
- Additional written input will be received until June 15th
- Council Committee July 16th
- Council August 13th

Simcoe Muskoka District Health Unit

- The City's lead advisor on public health issues
- Has provided assistance with public consultation process and with report preparation

Public Response

- Significant public response – largely negative
- Attention of national and international anti-fluoridation groups and forming of a local group
- Many concerns and questions have been raised
- These have been thoroughly investigated, summarized and addressed in the report

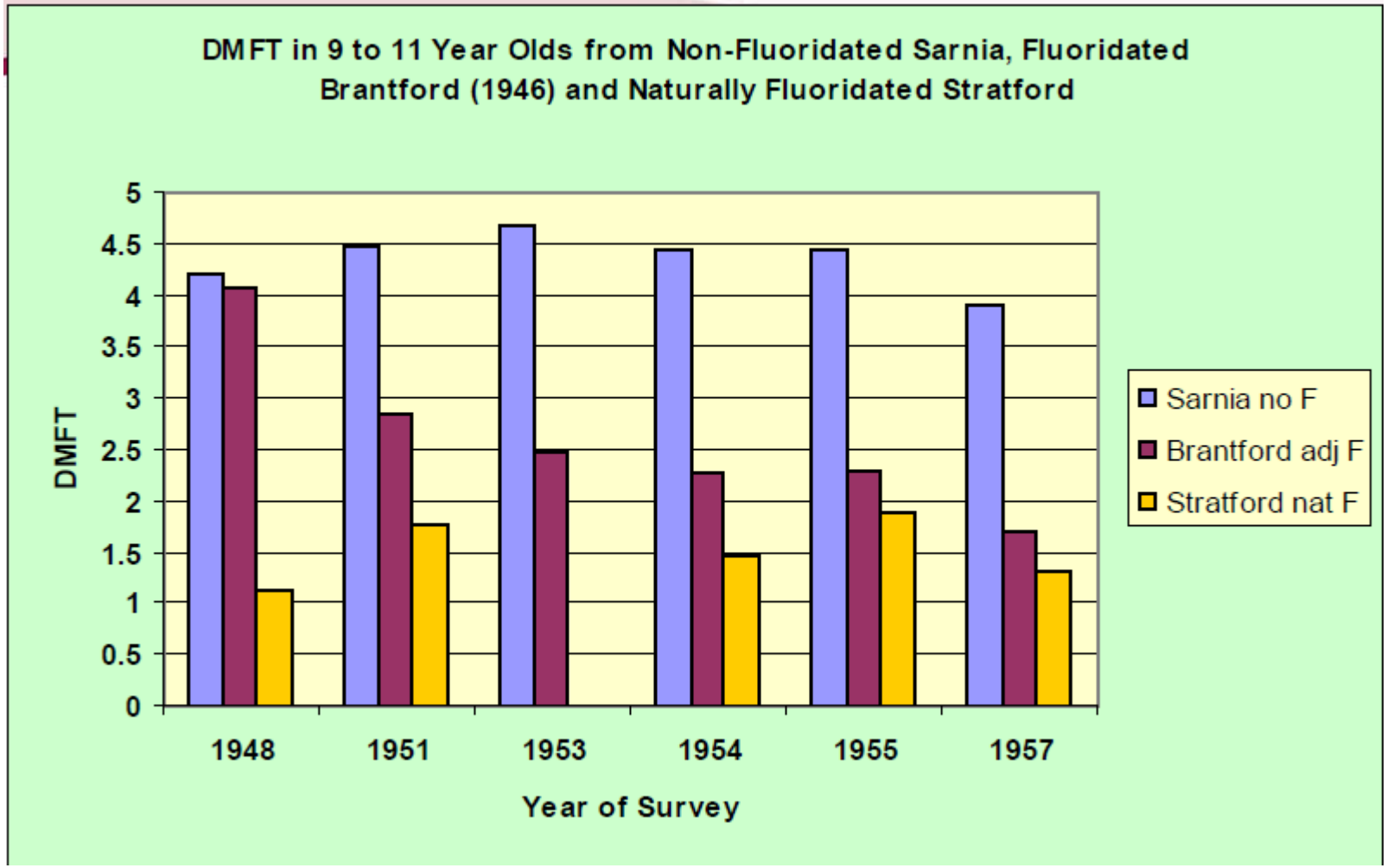
Fluoride and Fluoridation

- Fluorine: abundant element found as Fluoride ion, naturally found in water
- Fluoridation: controlled addition of Fluoride ions to optimal levels for dental health
- Natural Fluoride concentration in Orillia is 0.2 ppm – optimal is 0.7 ppm – max is 1.5 ppm

Fluoridation History

- Early research on natural fluoride levels in drinking water by American dentist in 1900s
- Further research by others in the U.S. established optimal level of 1 mg/L
- In the U.S.: official public health policy by 1950
- Fluoridation studied for over 65 years
- First began in Canada in 1945: Brantford, Ontario
- Fluoridation Act in 1961 in Ontario

Sarnia-Brantford-Stratford Study



Orillia History

- Council by-law authorized fluoridation in June 1966
- Citizen petition → Referendum → Decision overturned in December before fluoridation started
- Discussed again in 1980s but not pursued
- 2009 SMDHU report catches Council's attention

Support

- Growing list of over 125 health organizations, including: Health Canada, US CDC, WHO, Canadian and American Cancer Societies
- Local support includes:
  - Simcoe Muskoka District Health Unit Board of Health
  - Leadership Council of the North Simcoe Muskoka LHIN
  - Muskoka Simcoe Dental Society
  - Orillia Soldiers' Memorial Hospital
  - Chief Medical Officer of Health of Ontario
  - Ontario Medical Association
  - Ontario Dental Association

Fluoridation Act

- In Ontario, the fluoridation decision is made at the municipal level
- Council may implement fluoridation by by-law, under the Act
- Council has the option of a referendum, but not a requirement

Extent of Fluoridation

- 370 million people in N. and S. America, Europe, Asia, and Australia
- In Europe: UK, Irish Republic, Spain, Poland, and Serbia
- Plus fluoridated salt in: Germany, Switzerland and France
- 66% of Americans, 45% of Canadians, 70% of Ontarians

Fluoridation Decisions

- 35 Canadian municipalities have decided on fluoridation recently:
  - 18 maintained or restarted fluoridation, including 9 in Ontario
  - 17 stopped or did not start fluoridation, including 6 in Ontario
- 9% Net increase in U.S. population with fluoridated water between 2000 and 2010

Expected Benefits

- Reduction in tooth decay: 20-40% averaged across the total population
- 14-15% more children with no cavities
- Benefits are over and above those obtained by brushing, visiting dentist, good nutrition, etc.
- Based on 65 years of study including 18 major systematic reviews since 1997

A Systematic Review

- Systematic reviews periodically consider new studies in light of established research
- Not all studies are created equal – credentials, method, peer review, comparability, real to life
- Weight of evidence – research needs to be replicable

Recent Reviews

- Reviews since 1997 in: Europe, UK, Ireland, Australia, U.S., and Canada
- Overall conclusions about water fluoridation:
  - Effective and benefits all
  - Cost efficiency and population coverage
  - Safe: no increased health risks
  - No increase in fluorosis at 0.7 mg/L

Major scientific research and reviews

- Health Canada Expert Panel, 2007
- Oral Health in America
  A Report of the Surgeon General, 2000.
- Systematic Review of Water Fluoridation
  UK/International study, 2000.
- Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States US CDC, 2001.
- Forum on Fluoridation Ireland, 2001.
- A Systematic Review of the Efficacy and Safety of Fluoridation
  National Health and Medical Research Council, Australian Government, 2007.

Australian Review 2007

- Review of studies comparing communities with and without water fluoridation, meeting selection criteria for relevance and quality.

  Outcomes:
  - 35 original studies (2 systematic reviews): before-after, cross sectional, prospective / retrospective cohort, time series studies.
  - **14.3% - 15.5%** increase in children free of dental decay.
  - Reduction of **2.61** decayed / missing / filled teeth per child.(1)

1. *A Systematic Review of the Efficacy and Safety of Fluoridation. National Health and Medical Research Council, Australian Government, 2007*

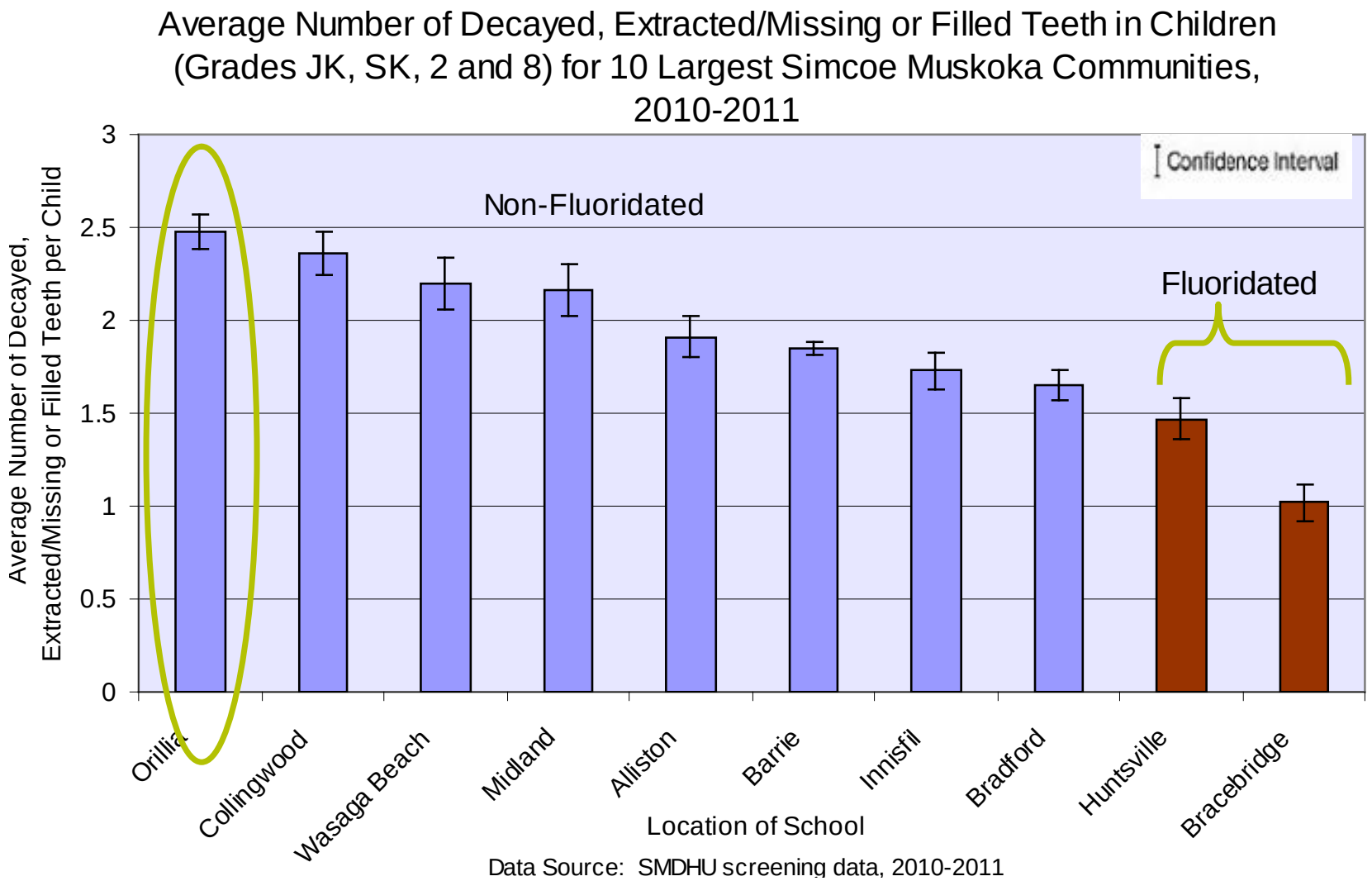
Health Canada's Review

- Development of Canadian Drinking Water Quality Guideline for Fluoride completed by the Federal-Provincial-Territorial Committee on Drinking Water
- Process from 2006 to 2011 included review by Health Canada, external experts and public consultation
- Comprehensive research and review of relevant scientific literature published in peer-reviewed journals
- Fluoride Guideline Technical Document: 1.5 mg/L maximum and 0.7 mg/L optimal

Health Canada's Expert Panel

- Expert panel selected by Health Canada's Water, Air and Climate Change Bureau
- Experts selected based on the expertise that was needed to complement in-house expertise.
- Studies not found to meet scientifically-accepted quality criteria are not included in the Health Canada final assessment
- i.e. the majority of studies on association between fluoride and lowered intelligence

Orillia's high rate of dental decay



Similar cities, different decay rates

A comparison of Orillia with St. Thomas, Ontario

Decay Rates for JK, SK, Grade 2, 2010/11	**Orillia** (**No** water fluoridation)	**St. Thomas** (**100%** of population has water fluoridation)
2006 Population (2006 Census)	30,260	36,110
Average number of decayed, missing or filled teeth per child	**2.5**	**1.4**
Percent of children with cavities	**44%**	**15%**

Source: SMDHU screening data 2010-2011 and data provided by Elgin/St. Thomas Public Health Unit

The impacts of dental decay

- Dental cavities are one of the most prevalent chronic diseases in childhood.(1)
- There are more hospital emergency department visits in Ontario, including for OSMH (2), for non-traumatic dental problems than for diabetes and hypertensive diseases combined.(3)
- Tooth decay can lead to difficulty with eating, increased pain, trouble concentrating and decreased self-esteem and social interaction.

1. U.S. Centres for Disease Control & Prevention
2. National Ambulatory Care Reporting System 2005-09
3. Community Dentistry & Oral Epidemiology, August 2009

Preventing tooth decay

- **Oral hygiene** – regular brushing, including fluoridated toothpaste (precaution re excessive quantities and swallowing in young children), and flossing
- **Healthy diet** – reduced sugar content
- **Dental care** – pit and fissure sealants, scaling, fluoride applications
- **Social determinants of health** – income, demographics, dental insurance coverage
- **Community water fluoridation**

SMDHU oral health services

- ✓ Oral health screening and surveillance in all elementary schools
- ✓ Preventive services including application of pit and fissure sealants, topical fluoride and scaling in elementary schools
- ✓ Oral health screening and surveillance in high schools
- ✓ Oral health screening and preventive services in most health unit offices
- ✓ Healthy Smiles Ontario clinics provide full dental services to low-income families and others on government-funded dental benefits
- ✓ Full dental treatment services at the health unit's Barrie clinic location
- ✓ Healthy Smiles Ontario bus visits Orillia, Wasaga Beach, Midland, Gravenhurst, Huntsville, Angus and Bradford
- ✓ Healthy nutrition work with schools, municipalities, and with the entire community

Cost of providing dental programs

Data: Spending for Dental Programs: Health Unit and Municipal Costs (2009)

Health Unit	Halton 90% Fluoridated	Simcoe Muskoka 7% Fluoridated
CINOT Spending	$357,965	$824,750
(25% Municipal dollars)	($89,491)	($206,188)
OW Dental <18 Yr Spending	$109,280	$421,075
(20% Municipal dollars)	($21,856)	($84,215)
OW Dental Adult Spending	$225,107	$357,501
(20% Municipal dollars)	($45,021)	($71,500)
OW Adult dentures	$160,360	$654,603
(20% Municipal dollars)	($32,072)	($130,921)
Total Spending	**$852,712**	**$2,257,929**
(Municipal Dollars)	($188,440)	($492,824)

CINOT = Children in Need of Treatment (Dental Program); OW = Ontario Works (Dental Program)

Fluoridation Additives

- NSF certifies 3 fluoridation additives:
  - Hydrofluorosilicic acid (HFSA)
  - Sodium fluorosilicate
  - Sodium fluoride
- HFSA is most suitable for Orillia based on: water system size, control and operation of feed systems, and worker safety

Fluoride Feed Systems

- No requirement for chemical pH adjustment is anticipated
- At max. capacity of WFP 2154 Litres per month per month of HFSA will be needed (supply in bulk)
- At max. capacity of WOW 429 Litres per month will be needed (supply in barrels)
- Construct fluoride room at WOW
- Bulk tank system needed for WFP plus minor building modifications

Fluoridation Costs

- Capital cost estimate of $160,000 to $180,000
- The initial staff estimate was $50,000 to $100,000
- Increased to take into account: bulk storage at the Water Filtration Plant, construction of fluoride room at the West Orillia Well, and to ensure worker safety
- Operating cost estimate of $25,000 per year ($0.75 per capita) for HFSA supply, equip maintenance and upkeep
- Time frame: nine to twelve months on approval

The cost benefit of fluoride

- The cost of providing CWF in Orillia is estimated to be less than $1 per person per year based on an estimated operating cost of about $25,000 per year and a capital cost of $180,000.
- Every $1 invested in community water fluoridation yields about $38 in savings each year from fewer cavities treated. (1)

1. Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. J Public Health Dent 2001;61(2):78-86.

The cost of fluoride application

- The cost for CWF ($25,000 per year) is favourable compared to providing topical fluoride application twice a year for all children and seniors in Orillia and adults under the low income cut off (target population 14,613):
  - $650,500 annual cost if applied by public health hygienists
  - $1.4 million annual cost if applied by private dentists

Health concerns related to CWF

- Evidence does not support a link between exposure to fluoride in drinking water and any adverse health effects including immunotoxicity, reproductive and/or developmental toxicity, genotoxicity, and/or neurotoxicity, cancer or intelligence quotient deficit.(1)

1. Health Canada. Findings and Recommendations of the Fluoride Expert Panel (January 2007).

Dental fluorosis

- Dental fluorosis can occur with increased levels of fluoride consumption
- Dental Fluorosis (mild): fine white streaks across the crowns of teeth.
- The prevalence of moderate dental fluorosis in Canada is low, and has been declining since 1996.
- The prevalence of visually apparent fluorosis is very low with community water fluoridation (0.5 to 0.8 ppm).
- No significant differences in the fluorosis scores between fluoridated and non-fluoridated areas of screened children in Simcoe Muskoka. Additionally, no children in Simcoe Muskoka with severe fluorosis and less than one per cent with moderate fluorosis.(2)

1. Findings and Recommendations of the Fluoride Expert Panel. Health Canada. January 2007: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php

2. Data Source: 2007/08 SMDHU research sample

Thyroid & kidney function

- SCHER report: “Human studies do not suggest adverse thyroid effects at realistic human exposures to fluoride.”(1)
- Data is too limited to determine any negative health effects on kidney function or on those with kidney disease from the consumption of water with fluoride concentrations of 0.7 mg/L.(2)

1. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011. (p.40).

2. Fawell J, Bailey K, Chilton E, Dahi E, Fewtrell L, Magara Y. (2006). “Fluoride in Drinking Water” World Health Organization.

Cancer

- Evidence does not support a link between exposure to fluoride and increased risks of cancer.(1)
- UK review in 2000 of 26 studies: 24 found no increase, 1 found an increase, 1 found a reduction in cancer rates.(2)
- Osteosarcoma – a rare form of bone cancer
  - SCHER report: “There is not sufficient evidence linking fluoride in the drinking water to the development of osteosarcoma.”(3)
  - Bassin study (2006) found an increase for 7 y.o. boys - Douglas letter (2006), larger data set found no increase. Kim study (2011) with more accurate exposure measurements (bone fluoride concentrations) found no increase in cancer.(4,5)

1. Health Canada. Findings and Recommendations of the Fluoride Expert Panel (January 2007).
2. McDonagh M, Whiting P, Bradley M et al. A Systematic Review of Water Fluoridation. 2000 NHS Centre for Reviews and Dissemination, University of York.
3. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011, pg. 39.
4. Bassin EB, Wypij D, Davis RB et al. Age-specific fluoride exposure in drinking water and osteosarcoma (United States). Cancer Causes Control. 2006;17.421-428.
5. Kim FM et al. Journal of Dental Research, October 2011; 90(10):1171-1176.

Pineal gland

- The pineal gland is a small organ located near the centre of the brain.
- No evidence that fluoride damages the pineal gland and very little evidence that fluoride has any effect on the functioning of the pineal gland.(1)

1. National Research Council of National Academies, Committee on Fluoride in Drinking Water, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. 2006. National Academies Press. Washington. D.C. Pages 252-256.

Intelligence quotient

- Most studies on IQ are from developing countries
- Difficult to know if the differences in IQ are true findings or related to how the studies are conducted
- Average fluoride levels in these studies are 3-5 times higher than optimally-fluoridated levels of 0.7 mg/L
- Two studies on childhood behavior and CWF in developed countries found no negative impacts.(1,2)
- Health Canada states: "… the weight of evidence does not support a link between fluoride and intelligence quotient deficit, as there are significant concerns regarding the available studies, including quality, credibility, and methodological weaknesses.(3)

1. Shannon FT, Fergusson DM, Horwood LJ. Exposure to fluoridated public water supplies and child health and behaviour. New Zealand Medical Journal, 11 June 1986; 416-418.

2. Morgan L, Allred E, Tavares M, Bellinger D, Needleman H. Investigation of the possible associations between fluorosis, fluoride exposure, and childhood behavior problems. American Academy of Pediatric Dentistry 1998;20:4; 244-252.

3. Health Canada, Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride December 2010

Fluoride exposure – Dermal absorption

- There are no studies specifically on the topic of dermal (skin) absorption of fluoride from fluoridated water.
- Because fluoride is an ion it is not expected to be absorbed through the skin when in a water solution with near neutral pH.(1)

1. European Commission, Directorate-General, Health & Consumers. Scientific Committee on Health and Environmental Risks (SCHER). Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water. 16 May 2011, pg. 40.

Fluoride exposure – Infant formula

- Infant formula prepared with water fluoridated at the optimal level of 0.7 mg/L maximizes the protective role of fluoride during the development of the permanent teeth while minimizing the risk of dental fluorosis.(1)
- No increase in moderate / severe fluorosis with infant formula feeding.

1. Health Canada: http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/health-sante/faq_fluoride-fluorure-eng.php

Environmental Considerations

- Orillia WWTC discharge is regulated by MOE: no Fluoride requirements
- CCME interim guideline of 0.12 mg/L uses a safety factor of 100
- No impact on aquatic life is expected from fluoridation
- Data shows that fluoride concentrations in Great Lakes is below guideline, on average, and no increasing trend (despite fluoridation)

Environmental Considerations

- 2004 paper on Water Fluoridation and the Environment in the U.S.: “no concern about the environmental aspects of water fluoridation”
- 2011 European SCHER report: adding fluoride to drinking water at 0.8 mg/L to 1.5 mg/L) does not result in unacceptable risk to water organisms.
- Fluoridation in Ontario is at 0.7 mg/L

Ethical Considerations

- Fluoridation benefits the whole community but limits individual choice
- March 2012 report by Quebec public health considers ethical implications of fluoridation:
  - "benefits justify impinging on the freedom of choice of people who do not wish to have their water fluoridated"
  - Recommends mandated fluoridation in Quebec municipalities of 5,000 or more
- Fluoridated water for 3% of pop in Quebec currently

Philosophical Considerations

- Scientists make mistakes
- Scientific method and peer-review process reveals errors and constantly improves
- Science is our best tool to improve our understanding of natural phenomena
- WHO, HC, CMOHO, SMDHU are committed to recommendations based on current scientific evidence

Worker Health and Safety

- Appropriate precautions for handling HFSA in concentrated form
- MSDS, worker education and training
- Zero lost time injuries of municipal water systems workers related to fluoridation chemicals in the last five years
- HFSA not classified hazardous waste, but is Class 8 corrosive substance under TDG

Transportation Safety

- In rare event of accident during transport of HFSA:
  - Trained agencies using established procedures to control and clean up
  - First responders would isolate 50m for a spill and 800m for a fire

Operational Considerations

- Automatic control of feed systems based on fluoride levels detected by analyzer
- Safeguards against overfeed include:
  - Continuous monitoring
  - Electrical interlocking
  - Day tanks limit amount of additive connected to suction side of feed pumps
  - Sampling throughout distribution system
  - Regular monitoring of day tank scales

Fluoride Source

- Fluoride is a naturally occurring ion
- Water sources contain many ions naturally, including fluoride
- All fluoride ions are chemically identical whether found in natural water sources, or in the rocks which are mined to extract fluoride
- Most fluoride additives for drinking water are produced from phosphorite rock used in manufacture of phosphate fertilizer

HFSA Manufacture

- Phosphorite rocks are processed by heating in acid
- Produces phosphoric acid-gypsum slurry and HF and SiF4 gases in solution
- Vacuum evaporators used to extract gases, then condensed to form HFSA
- Phosphoric acid is used in production of fertilizer
- HFSA is primarily used in fluoridation

HFSA Manufacture

- Only 50% of fertilizer producers make HFSA
- 65% of this is used in water fluoridation, the rest is used primarily in solar panel production
- No requirement for fertilizer companies to dispose of HFSA
- HFSA chief fluoridation additive since 1950s
- Two other additives are made from it

HFSA Regulation

- MOE requires that HFSA meet the NSF/ANSI Standard 60: Drinking Water Chemicals - Health Effects
- NSF 60 more stringent than pharmaceutical standards
- A Certificate of Analysis for each shipment would be reviewed by City staff
- Sampling and testing of shipments by City staff not required

HFSA Testing

- No HFSA exists after added to drinking water; it dissociates into its composite ions (H, F, Si)
- NSF 60 relies on toxicological studies completed by USEPA and Health Canada for Fluoride and impurities
- NSF, USEPA, Health Canada, and others worked together to create NSF 60 Standard

HFSA Impurities

- Trace amounts of lead and arsenic can be present in HFSA.
- NSF requires levels to be less than 10% of Health Canada's maximum when dosed at the maximum fluoride dosage allowed.
- NSF testing shows average arsenic levels are approximately 100 times less than Health Canada maximum.

Legal Liability: SDWA Standard of Care

- Includes City Staff that oversee water system and Councillors that could be charged with an offence if they fail to:

a) exercise the level of care, diligence and skill that a reasonably prudent person would be expected to

b) act honestly, competently and with integrity, ensuring the protection and safety of the users of the water system.

- Subsection 5: no liability if they relied in good faith on a report of a person whose professional qualifications lend credibility to the report.
- Recommendation by Director of Public works a P. Eng., based on those of WHO, HC, CMOHO, and MOH for SMDHU: fluoridation causes no harm, but provides significant benefits

Status of Lawsuits

- Fluoridation has been thoroughly tested in U.S. courts in last 60 years.
- Fluoridation viewed by courts as a proper means of furthering public health and welfare.
- No U.S. court of last resort has ever determined fluoridation to be unlawful.
- Fluoridation has also been deemed lawful in Canada.

How Council May Decide

- Weighing the pros and cons
- Weight of scientific evidence favours fluoridation
- Majority of public input has been opposed and their freedom of choice will be impacted
- Satisfied with conclusions of health experts?
- Is public response significant enough to go against this?

Summary

- Review including public input
- History and how it works
- Scientific reviews support fluoridation
- Products safe to handle and transport
- Fluoridation is not solving an industrial waste problem
- Legal. No personal liability for Councillors
- Dental health in Orillia is not great and will be improved with fluoridation
- Fluoridation will help control other municipal dental costs

Staff Recommendation

- Council receive and consider the staff report
- That fluoridation systems be established, maintained, and operated in connection with Orillia's water system
- Establish a capital budget of $180,000
- Considered by Council Committee in July and defer a decision by Council until August to allow time to consider the information

Next Steps

- Draft report and presentation slides available on City's website by May 30th
- Additional written input will be received until June 15th
- Final report will include: draft report plus Q & A from 2nd Public Forum and additional input to June 15th
- Report to CC in July, decision by Council in August

CWF Public Forum Recording Sheet

Group:	City of Orillia Second Public Forum on Fluoridation
Date:	May 29, 2012
Time:	6:30 – 9:40 p.m.
Location:	Orillia Council Chambers
Presenter:	Peter Dance (6:30 to 7:40 p.m.), followed by Q & A session (7:40-9:40 p.m.)
Recorders:	Megan Williams (SMDHU), Julia Crowder (City of Orillia)

Public Forum Proceedings

- Approximately 50 people in attendance.
- Warren Howes (moderator) introduced the evening proceedings.
- Peter Dance went through the presentation of the CWF report and recommendations (about 70 minutes).
- Expert panel was introduced: Dr. Charles Gardner (CG), Dr. Peter Cooney (PC), Dr. Dick Ito (DI), Peter Dance (PD), Jason Covey (JC).
- The floor was open for questions to the panel (3 min. per person).

Questions & Answers:

1. Ruth Bednar – Gravenhurst

Q: I don't see anyone on your panel that is anti-fluoride. Why aren't some of these experts represented here?

PD: The CWF public consultation process had lots of steps. It included an opportunity for anyone to come and present their views. At some point the public needs to hear what we're going to recommend to Council before it goes to Council. Other people who have expertise in other areas weren't needed. The experts we have here are the medical experts on this issue.

2. Gerry Cooper – Severn

Q: I see no response to my question that addresses a question about the 2009 oral health report. My analysis shows there is no correlation between tooth decay here and the other health units. What's the difference between the four health units (25, 28-30) that have a lower dental caries rate and the others that have fluoride? Two of them had lower rates than SMDHU area. Why? The WHO study shows no correlation in areas in Europe. This is a major shortcoming of the report. It merely parrots what comes out of Health Canada. Will Orillia consult with other health units that are non-fluoridated and find out why this is so, and then bring this forward? Will Orillia Public Works revise its report to add in this information?

PD: Please capture this in writing and provide it to myself or Jason.

CG: I think what you're touching on is the effectiveness of fluoride in preventing dental decay. What is the evidence? Is it local studies or systematic reviews of the literature? The evidentiary base we use is on the community systematic reviews. All of these have shown a correlation between cavities and fluoride and a measurable reduction in cavities. We rely on the consensus of the scientific literature. For the 2009 data we were looking at the overall pattern. We acknowledge there are other factors such as diet, dental care and socio-economic factors which can vary from community to community that play a role in decay rates.

DI: We did a statistical regression analysis and that's how we came up with the results.

PC: It's a good point you raise about international decay rates. These show that fluoride works. We have a whole bunch of ways of getting fluoride to people. Some countries have naturally occurring fluoride in water; some add fluoride to milk and salt.

3. Dr. Evelyn Elsey (Dentist) – Orillia
I've spent 34 years working in dental care in Orillia. I grew up in Toronto and had zero cavities. In Orillia I have to fill 4-10 cavities a day. As a dentist working here in Orillia I've had to fill more cavities that in areas where the water is fluoridated. I urge you to fluoridate the water here in Orillia.

4. Dr. Sarah Barker (Pediatrician) – Orillia
Q: I want my children to have the most benefit for their health. What do I have to worry about for my children and those I treat with fluoride?

CG: Mild fluorosis is the only issue related to CWF. We don't see this in this area with fluoridated water. Usually mild fluorosis is only seen through a dental examination. The onset of fluorosis is not elevated with optimal levels of fluoride in water. Health Canada has seen a reduction of fluorosis in Canada.

5. Jeffery Oliver
Q: You talked about dermal absorption and the lack of human skin's ability to absorb water. If skin can't absorb water, how can teeth absorb it?

PC: The major effect of fluoride is topical. (Dr. Cooney explained the effect of fluoride on tooth enamel and described the chemical change in the mouth and how enamel gets harder as fluoride covers the tooth). Systematically, as fluoride passes over teeth it gets absorbed by the enamel. As well, it enters into plaque.

6. David Mallinson – Orillia
Q: At what point does HSFA disassociate in water?

PD: Fluoride is very diluted in water and will disassociate into ionic form almost immediately.

7. Joyce Ward – Orillia
Q: Based on the expertise and evidence I support fluoridation for Orillia. I commend you for looking at the issue. What can citizens expect if this goes forward for evaluating its effectiveness and giving feedback?

CG: This would be a prime opportunity to monitor the impact of fluoride in Orillia and to report back to the community and more broadly. To do this we would customize our dental screening surveillance with children and show the effect of fluoride on dental decay rates. We'd also include surveillance on fluorosis.

DI: At a minimum we already screen all JK, SK and Grade 2 children and add other grades depending on the risk level of the school. We can add a module to our screening to look at dental fluorosis, perhaps every 2-3 years.

8. John Erwin – Orillia
Q: What's the role of sugary foods in the 20th century on dental decay? Is there a study where they looked at tooth decay related to sugary in the diet and in processed foods?

CG: There are many studies on diet and decay, including studies that show eating vegetables and fruit correlate with a reduction in tooth decay. There are also general studies that look at different groups and income levels related to tooth decay. As a health unit we are working with municipalities and school boards to improve nutrition for the population, for example ensuring healthier food options in community centres and in schools. Fluoride has its own independent benefit in reducing dental decay over and above good nutrition and the other factors that impact on oral health.

PC: Studies have been done in Holland. There are three key things that impact on dental decay: bugs, food and host. Yes, if you reduce sugar, this will help. If you reduce the bugs, bacteria and sugar, even better. If you can improve all three (including strong enamel in the "host") this is the best case scenario. Fluoride impacts the host making the teeth strong. We need to get a person's resistance to decay up by hardening the enamel, improve the diet and improve oral hygiene.

9. Sue Doso – Orillia
Q: Why in 2009 has this issue come up again, since Orillia said no in 1966?

PD: I'm not aware of any discussion that took place on the record on fluoride between late 1980's and 2009. There was no discussion at the staff or council level about fluoride then. It came up again because of the health unit's oral health report of 2009. The council was interested in investigating fluoride as an option at that time.

CG: We provide information and reports to our communities on public health issues. Oral health is just one of many topics that we report on. We focused on oral health in 2009 after we saw an elevation of dental decay in Simcoe Muskoka. Fluoride was one of the issues that was mentioned in the report. We looked across the province and saw that fluoride was one of the issues being discussed in several communities. Community water fluoridation in some communities was being challenged and so the public health community started to mobilize on this issue across the province. We didn't know what the response would be to our report when we released it, but it stimulated interest in Orillia, Muskoka and Tottenham.

10. Jeff Holec – Orillia
Q: There is an extensive list of experts and communities that support fluoride in the report. Why were the groups not supporting fluoride not listed in order to present balance and why was this not in the recommendations?

PD: Many of these communities are already documented. We will address your question and include the anti-fluoridation groups in the report.

11. Donald Schweitzer – Orillia
Q: Orillia has a high number of single teen mothers as well as wealthy retired people. How did you collect your data from St. Thomas? Is it based on single family or on average income data? Shouldn't the data just look at children?

CG: We found a match community using Statistics Canada data. Our epidemiologist looked across the province using several socio-economic indicators to find a comparator community. Those indicators for St. Thomas demonstrated that it was in line with Orillia's socio-economic status. These indicators included population, unemployment rate, education level, percentage in low income after tax, percentage of lone parent families, and percentage of people with dental insurance We compared the available data and that's what we used, and we did look at children.

DI: We used the Stats Can data and average income.

12. Scott Miller – Orillia
Q: There are 17 communities across Canada that have stopped fluoridation. Why should we consider fluoridating when these communities have stopped?

PD: There have been a number of communities that have started and stopped CWF. Some communities are on both sides of the discussion.

13. Steve Goulter – Orillia
Q: 99% of our water is wasted, only 1% is ingested. Children drink little water. If for every $100 spent $99 is being thrown out it makes no sense to fluoridate the water. I don't think dumping HFSA in our water and preventing one cavity per child is worth it. Is this a good use of taxpayers' money?

PD: As a cost investment, yes I think it's a good one. On the balance it's a good use of money compared to the other ways of preventing tooth decay.

14. Dr. Sue Surry (Pediatrician) – Orillia
Q: I echo other comments about coming from a fluoridated community (London) and I'm shocked about what I see in kids' mouths. Even one cavity more per children is too much. How will council decide when there is such a strong professional support in the scientific community for fluoride? What arguments from those opposed could sway council against the medical and scientific expertise and support for fluoride?

PD: Council listens to its constituents and council can be swayed as they listen to the intensity of the conversation. The decision-making process will consider how upset some members of the community will be if fluoride is implemented. Those in support of fluoride seem to hold view less strongly. Council will listen to those who are vocal.

15. Dianne Orton – Orillia
Q: I have hypothyroidism, lived in London where there was fluoridation. How is it that the health unit was invited to be on the panel? And when was Health Canada, or this person representing Health Canada, invited? Was his presence invited by the City and the Mayor?

PD: In 2009 council initiated an effort to consult about the use of fluoridation. In 2011 the (newly elected) council supported a decision to continue with consultations. Tonight we invited Health Canada to come; in February there were a number of organizations that came to the public forum. But no, you will not find a written invitation from council.

16. Kathryn Johnstone – Orillia
Q: I grew up in Toronto with fluoridation yet my teeth are full of metal. When my children were young our dentist recommended providing our children with a fluoridation coating and they are now contending with having the results being addressed in their teeth. Should it (CWF) not be a personal choice?

CG: This is really a philosophical question, choosing between interventions for the good of the entire population and the rights of the individual. We chlorinate water; we add iodine to salt; we fortify food. These were all group decisions and it is the nature of this type of decision, in our society, that you need a democratic process to decide. For fluoridation, municipal councils have had to make the decision. In some cases they vote in favour, in some they don't.

PC: We recommend water fluoridation because it's effective in low doses. Health Canada recommends fluoride supplements in rare cases. Dentists and pediatricians sometimes recommend it for people with

mobility issues.

17. Lynn Martin - Orillia
Q: I've lived in Toronto all my life and every one of my teeth has had a cavity. I developed hypothyroidism as well. I moved to Orillia in 2005 and since 2005 I no longer have hypothyroidism… There are many foods and beverages that contain fluoride. And there are no regulations regarding the fluoride content of food. How are we going to control our personal intake levels? I don't know how much fluoride is in the food, so I can't control my intake.

PD: The naturally occurring level of fluoride in Orillia's water is 0.2 mg/L now. With fluoridation we would elevate that to 0.7 mg/L.

PC: The Health Canada Expert Panel reviewed tolerable daily intake levels from all sources. And your water is within very safe limits. To reach toxic/fatal levels from fluoridated water, you would have to drink 15,000 litres in one sitting, and at that point the amount of water would itself be fatal. It would require 15 litres a day for 10 years to create toxic levels. Levels of fluoride in your regular food basket are not a risk.

Lynn: But how are we to monitor what we get in our food?

PC: There have been many food basket studies. One has been conducted by Health Canada, there was one by the Food Institute, there was a technical panel in Iowa - all concluded that the daily food basket does not contain levels of fluoride that will pose a problem.

18. Jeff Oliver
Q: I find this part of this whole exercise reprehensible. Canadian citizens are more and more skeptical about decisions made by the federal government, and the provincial and municipal governments. Unless you are an expert in Orillia who has a thorough knowledge of the issue, you can't make a choice. We needed a bona fide debate tonight … to hold you accountable for the arguments you make.

PD: We have tried to create an open discussion. (PD explains history of public meetings, opportunities for public input, in past and future.) The public has had the opportunity to give their opinion throughout the public consultation process, including the ability to send in comments, information and questions, which will all be in the report.

19. David Stinson - Orillia
Q: I know you (Dr. Gardner and Peter Dance) and respect your intelligence and integrity, but on this issue I demur. We live in a sea of chemicals … and I am a little unhappy that one more will be added to the list, without my consent. There is a social engineering aspect of this, in that you are targeting fluoride as a cure for poverty. If we cannot control for levels of consumption how do we show a correlation and trust that the positive effects of fluoride are all that goes on? We are dealing with a growing distrust of municipal water supplies.

PD: It's the surface of the teeth that we dose with fluoridated water. And we know that the levels (of fluoride in optimally fluoridated water) will not impact people's health.

CG: Community trials are conducted to determine the impacts on populations. Fluoridation is a community health measure, and the results are measured over time in community rates of decay. The rates of dental decay are measured for communities that commence (or in some studies, discontinue) community water fluoridation compared with communities that are not fluoridated. From this we measure the impacts of fluoridation on dental decay.

Regarding the relationship between poverty and decay, we have studies showing that lower income populations have higher rates of decay. We know that there is higher benefit for those populations with community water fluoridation, and there is a disproportionate benefit for those with the worst rates of decay.

Regarding concerns about chemical effects on health, it is necessary to evaluate each chemical separately. Fluoride is an ion, and it has benefits for dental health. Iodine is an ion and it is essential for some functions. Fluoridation has been looked at very thoroughly over the past 60 years.

PC: Its benefit is greatest in the lower socio-economic groups but it also moves the average rates of decay over in children… and there are advantages for adults as well. We can see the results over time. Forty years ago 24% of Canadian adults had dentures. Now only 6% of Canadian adults have dentures. Canadians are getting older and they are keeping their teeth. There is a social gradient but it's because of the disease levels.

20. James Upper - Orillia
Q: In presentations by the health unit and the oral health report, your comparisons between communities included extracted teeth. Why did you include extracted teeth in the comparison? I had most of my primary teeth extracted, because they wouldn't come out normally. There are other reasons people may have their teeth extracted. Is that taken into consideration?

DI: The DMFT figure is a measure of all results of decay. It measures issues because of decay.

21. Richard Bednar - Gravenhurst
Q: Fluoridation has been in Muskoka since 2005. I do not acknowledge the use of fluoride in water. The supporters of fluoridation are biased. I have lived on a well for 25 years. It is junk food that gives you cavities. I want to thank Susan Schwietzer of OCAF for informing the citizens about this issue. Have you read the articles by Hardy Limeback of the University of Toronto, of the faculty of dentistry concerning the levels of intake from various sources? They don't put the amount of fluoride on the water bill in Gravenhurst. It's not on the label on pop bottles. Are you going to put it in the water bills in Orillia?

PD: We would make a variety of efforts to make the public aware of the fluoridation. We would consider putting a note about CWF into the water bills.

22. Scott Miller - Orillia
Q: Please clarify: Between 1999 and now no unfluoridated communities have chosen to fluoridate. Why is that?

PC: I'm not certain of that statistic. But a number of communities have stopped and then voted to restart. Most recently Dorval had stopped fluoridation and there was a marked increase in decay and they have opted to restart. In the United States the Centers for Disease Control state that since 2000 there has been an increase of about 9% in fluoride consumption through community water fluoridation.

Scott: But since 1999 no unfluoridated communities have opted for it?

PC: That is something I would have to verify.

23. Steve DePiero - Orillia
Q: I have worked as an anesthesiologist for 11 years. Previously I worked in a community 10 times the size of Orillia, and now I work at Orillia Soldier's Memorial Hospital. I am amazed at how many general anesthetics I have had to administer to children for oral surgery. The operating rooms in Orillia see as

many children for general anesthetics to deal with dental decay as the ORs did in that much larger community, despite the population difference It's an absolute shame that children have to go through the stress of an operation and general anesthetics experience for such a preventable problem. I am asking about the budget impact of fluoridation. Have the costs of pediatric dental reconstruction been included in the costing calculations?

PD: We haven't done any further characterization of the savings that would be realized, other than what have seen in slides.

CG: More than six per cent of the children in Orillia, as opposed to about three per cent in fluoridated communities in Simcoe Muskoka, have required major dental surgery. In terms of CINOT dollars – we can measure the differences between Halton region and extrapolate potential savings. However those are only for the children of low income families who would qualify for this program. We do not have information on the potential cost saving for the entire population. I'm not aware how we could capture that.

24. Gerry Cooper
Q: Regarding lead leaching into the water. Would you add a section on this in the report? There is good science, chemical engineering knowledge that this becomes an acidity issue. Too much lead affects blood-brain development. I have had tests done on my water and there was lead in my own pipes. It's still used in the solder in bass fixtures. It's a real public health risk. Are you willing to look at fluoride and its connection to lead as part of the report?

PD: We are aware of the issues of lead in water lines. We anticipate the lead concentrations being very low. But if you have different information we would take it and receive it.

25. Stephanie - Orillia
Q: I'm upset with the denigration of the opposition's evidence. You have not produced good studies. Why don't you do those studies yourself? Really, seriously look at the issue so that you can analyze it property. My question is to the city: if you go ahead with fluoridation, there are a number of people who because of medical conditions will not be able to drink the water. Will the city compensate them for their use of other sources for their drinking water?

PD: Everyone drinking city water is already consuming 0.2 mg/L of natural fluoride. I cannot speak for council's stand on this. But we (staff) would not be recommending compensating – probably not.

26. Dianne Orton
Q: There are no fluoride opponents in this panel. Why is that? I just read a Collingwood news article saying that the Healthy Smiles Ontario van had just rolled into town, the eighth place it has visited. And their cavity rates are high too. The hours of the van are from 9:30 to 3:30 or 4:30. I'm trying to figure out the cost of the unit when it's just the eighth community being visited. How much do you really care about people's teeth?

DI: HSO van has been operating for about a year. This is the eighth new community the van has been visiting. It has been to seven others. It's very difficult to make arrangements because it takes up three or four parking spaces, and requires a special electrical connection. We also have to make sure there are enough patients for us to see; we have to build up interest in the communities.

Dianne: How many students have been served by the van?

PD: We can get you those details.

Dianne: I was thinking maybe the school yard would have lots of good places where it could park.

27. Steve Goulter
Q: I have sent you information on the lead and aluminum, which is freed up by the flocculents. There are traces of aluminum in the process and with fluoride ions, it combines with lead and carries it across the blood-brain barrier. There is a wealth of information out there about this. You haven't done your due diligence. Regarding your study stating 60% of the people in Orillia support fluoridation…where is that study? That is certainly not our experience. I have spoken to hundreds and hundreds of people in Orillia and they have all been against this. Show us your study.

PD: We can gather that information and make sure it's in the report.

28. Ruth Bednar - Gravenhurst
Q: I tried very hard to get you to speak to Dr. Limeback. Why did you refuse to have this debate with Dr. Limeback?

CG: I arranged to have James Beck and yourself appear as a delegation before the Board of Health. We have had public dialog opportunities, including public meetings tonight and in February; these have been opportunities for anyone to attend and participate. You have had the opportunity to speak with our staff, I believe with Dr. Dick Ito and Dr. Peter Tanuseputro. This process is something we all learn through.

29. Richard Bednar - Gravenhurst
Q: I have read all your references and don't find them satisfactory. The truth is out there, but your references are all government references. I have never seen any independent references. I'd like to see an independent, neutral body studying this without any outside influence.

CG: The balance of the studies we have referenced have been university studies such as by the University of York in England. Health Canada's review was of academic studies. Government agencies such as Health Canada have done systematic reviews. Government has played an important role, but they're not the only sector looking at this. There are also professional associations in the dental and medical communities that have conducted reviews.

Richard: I lump medical and universities in with the government. I have seen it all, and I wouldn't use medical or academic bodies. I would rather see an independent laboratory study.

30. Susan Schweitzer - Orillia
You (Peter Cooney) promised at the February meeting that you would participate in a debate. You never came; you were always too busy. And yet here you are now. Your stand here is biased and unconscionable. Nine out of 10 of the hundreds of people we have polled are not in favour of fluoridation. We deny you the right to mass medicate, we demand the right to individual, informed consent. We are putting council on notice to make the right decision.

31. Steve DePiero - Orillia
We have seen the reactions in the past to seat belt laws and to vaccination. There is a lot of support out there for fluoridation. We need to listen to the expertise. Sometimes you have to listen to your gut, and sometimes you have to listen to your brain. We need to collect all the data and make a decision based on science.

PD: The Fluoridation Act has protective safeguards for the public, allowing for petitions, and a council must call for a referendum if 10% of the population asks for it.

32. Doug McCarrell - Orillia
Q: Why can't we get together with everything we know in the 21st century and put something forward that we can all use and agree on? There has to be better technology than this. Community water fluoridation is 60-year-old technology. There must be something better for the City of Orillia.

CG: We have to rely on research for the best solutions. And sometimes things have lasting benefits, for example chlorine in water. It's important to continue to monitor CWF. Fluoride still benefits dental decay.

Doug: But is that the only pro? Let's educate ourselves together, and get new technology. We deserve the best for Orillia; let's not flog the party line.

CONCLUSION WITH THANKS TO PARTICIPANTS
PD notes June 15 deadline for written input.

Additional Information in Response to Questions
At May 29th Public Forum

At the second public forum on May 29th, additional information was promised in response to a few specific questions asked. This additional information is presented below.

Question 10 from Jeff Holec – Orillia:
There is an extensive list of experts and communities that support fluoride in the report. Why were the groups not supporting fluoride not listed in order to present balance and why was this not in the recommendations?

Additional Information Response to Question 10:
Groups opposed to fluoride include the following:

- Orillia Citizens Against Fluoridation
- Canadians Opposed to Fluoridation
- Fluoride Action Network
- Canadian Association of Physicians for the Environment
- Council of Canadians
- International Academy of Oral Medicine & Toxicology
- Great Lakes United
- Keepers of the Well

Question 24 from Gerry Cooper:
Regarding lead leaching into the water. Would you add a section on this in the report? There is good science, chemical engineering knowledge that this becomes an acidity issue. Too much lead affects blood-brain development. I have had tests done on my water and there was lead in my own pipes. It's still used in the solder in bass fixtures. It's a real public health risk. Are you willing to look at fluoride and its connection to lead as part of the report?

And

Question 27 from Steve Goulter:
Q: I have sent you information on the lead and aluminum, which is freed up by the flocculents. There are traces of aluminum in the process and with fluoride ions, it combines with lead and carries it across the blood-brain barrier. There is a wealth of information out there about this. You haven't done your due diligence. Regarding your study stating 60% of the people in Orillia support fluoridation…where is that study? That is certainly not our experience. I have spoken to hundreds and hundreds of people in Orillia and they have all been against this. Show us your study.

Additional Information Response to Questions 26 and 27:
Community water fluoridation does not cause an increase in the amount of lead or aluminum in drinking water. It does not leach lead from plumbing fixtures or aluminum from cooking appliances. Fluoridated water at optimal levels does not increase the amount of lead or aluminum absorbed into or the amount that accumulates in the body.

Drinking fluoridated water does not increase the risk of any mental disorders or decrease in mental abilities. A number of reviews on community water fluoridation have studied the scientific literature and have concluded that water fluoridation has no effect on the solubility, bioavailability, or bioaccumulation of any form of lead or aluminum.[1,2,3,4]

Concern that using fluorosilicate additives to fluoridate drinking water causes water system pipes to corrode is not supported by science. At the level recommended by Health Canada for fluoridation of public water supplies (0.7 mg/L), the fluoride ion has little influence on either corrosion or the amounts of corroded metals released into the water. Fluorosilicates contribute to better water stability with less potential for corrosion, because silica stabilizes the pipe surface.

Waters differ in their resistance to changes in their chemistry. All waters contain divalent metals such as calcium and magnesium that cause water to have properties characterized as hardness and softness. If a water is "hard," it is less likely to "leach" metals from plumbing pipes but often leaves a deposit on the inside of the pipe, while if a water is "soft" it has less of a tendency to leave deposits on the inside of plumbing pipes. The tendency of water to be corrosive is controlled principally by monitoring or adjusting the pH, buffer intensity, alkalinity, and concentrations of calcium, magnesium, phosphates, and silicates in the water.

Orillia does not currently practice chemical adjustment of its water for the purpose of reducing corrosion, and no requirement to introduce this practice along with fluoridation is anticipated. The pH of Orillia's treated water (7.8 to 8.1) is near the high end of the acceptable range (6.5 to 8.5), as set by the Ontario Ministry of the Environment. In addition, Orillia's source water is naturally "hard" meaning that, due to buffering agents naturally present in Orillia's raw water, the addition of HFSA is not expected to cause any significant change in pH.

In a paper[5] from the U.S. Environmental Protection Agency published in the International Journal of Environmental Studies in 2000, the authors examine recent studies that have attempted to show a link between fluoridation of drinking water and increased levels of lead in the blood. The paper looks at established science and compiles fundamental chemical literature, placing an emphasis on the chemistry and conditions of most relevance to public drinking water. The overall conclusions are that no credible evidence exists to show that water fluoridation has any quantifiable effects on the solubility, bioavailability, bioaccumulation, or reactivity of lead compounds. Additional conclusions in the paper include:

- Dissociation of HFSA in typical drinking water is complete and instantaneous.
- No significant change in pH is attributable to the addition of HFSA to typical drinking water to increase fluoride to recommended levels.

The authors also consider and refute the methodology of some previous epidemiological studies of lead exposure. Concerns with lead and community water fluoridation were raised by several published reports by Masters and Coplan (1999,

2000, 2007) who suggested an association between elevated blood levels of lead in children with possible neurotoxicity and living in communities that used silicofluorides to fluoridate their drinking water.[6, 7, 8] These reports have been refuted by Urbansky and Shock (2000) who contend that Masters and Coplan failed to control for other factors that may have contributed to blood lead levels, and failed to link lead levels with actual consumption of optimally fluoridated drinking water.[5] Urbansky and Shock also point out that the mechanism for how silicofluoride increases blood lead levels proposed by Masters and Coplan fails to account for the fundamental chemistry involved in the interaction between not only fluoride and lead but the other chemical constituents normally found in drinking water.

A different result from Masters and Coplan was reported by Macek et al (2006) using data from 9,477 children aged 1-16 years. They found "overall, the PbB (blood lead) concentrations of children living in counties receiving silicofluorides (sodium silicofluoride and hydrofluosilicic acid) did not differ significantly from the PbB concentrations of children living in counties without fluoridated water."[9] Macek et al's research confirmed the findings of the Fort Collins Technical Study Group (2003) who reported no correlation between elevated childhood blood lead and percent of the population receiving hydrofluorosilic acid (HFSA) treated water in Colorado counties after statistical regression analysis which controlled for percent of housing with high-risk lead housing in each county.[3]

In their articles Masters and Coplan proposed a mechanism for the increased blood lead levels in children living in communities that used HFSA to fluoridate the drinking water. They contend that HFSA does not completely hydrolyze and that HFSA corrodes lead-bearing plumbing fixtures, thereby elevating the level of lead in the drinking water.[7,10] Urbansky and Shock in their study show that HFSA completely hydrolyzes into fluoride ions and silicates and so cannot cause corrosion and increased lead levels in drinking water.[5] This was also confirmed by testing by the Fort Collins Utilities who reported that lead levels in drinking water were below the detectable limits (0.001 mg/L) before and after addition of HFSA.[3]

Similar to the lead and fluoridation question, concerns have been raised about aluminum and fluoridation. Two major reviews have found no evidence that fluoridated drinking water at optimal levels does not leach out aluminum from cookware or other appliances.[11, 12] The interaction of aluminum and fluoride and the uptake of an aluminum fluoride compound (AlF_3) into a rat brain was reported by Varner et al (1998).[13] The rats were given water with AlF_3 and the compound was found in the rat brain post mortem. The authors postulated the formation of AlF_3 complexes from the ingestion of food and water containing fluoride and aluminum and an association of aluminum fluoride compounds with neurodegenerative diseases. Jackson et al have reported that AlF_2 and AlF_3 formation in optimally fluoridated drinking water is not significant.[4] Isaacson et al in their study concluded that "there is evidence supporting a neuroprotective effect of fluoride in water supplies in regard to dementia from epidemiological studies whether or not Al is also in the water."[14]

Additional Information in Response to Questions
At May 29th Public Forum

A research project by Forbes et al based on the Ontario Longitudinal Study on Aging reported that "men living in areas with high aluminum and low fluoride concentrations in the drinking water were three times more likely to have some form of mental impairment than those individuals living in the areas with low aluminum and high fluoride levels."[15] As stated previously HFSA completely hydrolyzes into fluoride ions and silicates. Shcherbatykh and Carpenter in their review of the etiology of Alzheimers's Disease reported that research indicated fluoride itself was not related to any deficit in cognitive function and higher silicates concentrations in drinking water may be protective against dementia.[16]

Based on the existing scientific literature, the evidence indicates that optimally fluoridated drinking water does not affect the solubility, bioavailability, or bioaccumulation of any form of lead or aluminum nor does it increase the risk of cognitive or neurodegenerative disorders.

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4. Jackson PJ, Harvey PW, Young WF. Chemistry and Bioavailability Aspects of Fluoride in Drinking Water. Report No.: CO 5037. July 2002
5. Urbansky ET, Schock MR. Can fluoridation affect lead(II) in potable water? Hexafluorosilicate and fluoride equilibra in aqueous solution. Int J Environ Stud 2000;57:597-637.
6. Masters RD, Coplan MJ. Water treatment with silicofluorides and lead toxicity. Intl J Environ Studies 1999; 56: 435-449.
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8. Coplan MJ, Patch SC, Masters RD, Bachman MS. Confirmation of and explanations for elevated blood lead and other disorders in children exposed to water disinfection and fluoridation chemicals. NeuroToxicology 28 (2007) 1032–1042
9. Macek MD, Matte TD, Sinks T, Malvitz DM. Blood Lead Concentrations in Children and Method of Water Fluoridation in the United States, 1988–1994 Environ Health Perspect 114:130–134 (2006)
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11. National Research Council. Fluoride in Drinking Water: A Scientific Review of EPA's Standards Committee on Fluoride in Drinking Water, Board on Environmental Studies and Toxicology. Washington, D.C.: National Academy Press, 2006.
12. Center for Reviews and Disseminations. Fluoridation of Drinking Water: A Systematic Review of its Efficacy and Safety. York, UK: University of York, 2000.
13. Varner JA, Jensen KF, Horvath W, Isaacson RL. Chronic administration of aluminum–fluoride or sodium–fluoride to rats in drinking water: alterations in neuronal and cerebrovascular integrity. Brain Research 784_1998.284–298
14. Isaacson RL, Varner JA, Jensen KF. Toxin-Induced Blood Vessel Inclusions Caused by the Chronic Administration of Aluminum and Sodium Fluoride and Their Implications for Dementia. Annals New York Academy of Sciences, 1997
15. W.F. Forbes, S. Lessard and J.F. Gentleman, Geochemical risk factors for mental functioning, based on the Ontario Longitudinal Study of Aging (LSA) V. Comparisons of the results, relevant to aluminum water concentrations, obtained from the LSA and from death certificates mentioning dementia, Can J Aging 14 (1995), 642–656.
16. Shcherbatykh I, Carpenter DO.The Role of Metals in the Etiology of Alzheimer's Disease Journal of Alzheimer's Disease 11 (2007) 191–205

Additional Information in Response to Questions
At May 29th Public Forum

Question 26 from Dianne Orton:
Dianne: How many students have been served by the (Healthy Smiles Ontario) van?

Additional Information Response to Question 26:
Healthy Smiles Ontario is a new, no cost dental program for children 17 and under who do not have access to any dental coverage and who meet the program's eligibility requirements. The program covers regular visits to a licensed dental care provider, such as a dentist or dental hygienist, to establish and maintain good oral health. It covers a full range of dental services including check-ups, cleaning, fillings, x-rays, scaling and more. It does not cover cosmetic dentistry (such as teeth whitening), orthodontics (such as braces) or urgent/emergency dental services. However, an urgent or emergency oral health issue for kids 17 and under may be covered through the Children In Need of Treatment (CINOT) program offered by the health unit.

Children eligible for the Healthy Smiles Ontario program may receive care through participating dental care providers. A new full service clinic is now open in Barrie as well as a mobile clinic that visits local communities throughout the year. Children who already have a dentist will be able to continue to see their dentist, providing he or she is participating in the program. Children 17 and under may be eligible if:

- They are residents of Ontario;
- They are members of a household with an Adjusted Family Net Income of $20,000 per year or below; and,
- they do not have access to any form of dental coverage (including other government-funded programs, like Ontario Works).

Please see the table below for HSO statistics for May 1-31, 2012. These data were collected by manually searching records, and that this why only one month of data is provided.

Additional Information in Response to Questions At May 29th Public Forum

Healthy Smiles Ontario Clinic Statistics by Location and Client Type, Simcoe Muskoka, May 2012

Data Source: SMDHU Oral Health Clinic Records

Clinic Location:	# Clinics	Total # Clients	# Children (<=17 years old)						# Adults (>=18 years old)	
			# Healthy Smiles Ontario (HSO) clients	# Children in Need of Treatment (CINOT) Clients	# Ontario Works (OW) children	# Dental Screenings	# Ontario Disability Support Program (ODSP) children	# Non-Insured Health Benefits (NIHB) children	# OW Adults	# ODSP Adults
Orillia	3	13	2	5			3		3	
Gravenhurst	2	13	2	5	5			1		
Midland	2	15	3	7	3				2	
Collingwood	1	6		3	2				1	
Wasaga Beach	1	5		3	1				1	
Angus	1	4				4				
Bradford	1	4		2		2				
Huntsville	2	10		7	1		2			
Barrie	17	92	24	30	11		1		22	4
Total:	**30**	**162**								

Note: the number of clients served depends on the complexity of the service provided, transportation time to the clinic location, and number of staff available. The number of clients served in May 2012 may not be representative of all months of the year.

APPENDIX O
WATER FLUORIDATION - RRFSS PROVINCIAL HEALTH INDICATOR REPORT

Water Fluoridation

PURPOSE OF MODULE

The purpose of this RRFSS module is to monitor public opinion about the addition of fluoride to public drinking water when the natural amount is too low to help prevent tooth decay. In 2007, approximately 45% of Canada and 76% of Ontario had fluoridated water[1].

KEY FINDINGS

- In 2011, 56% (95% CI, 53-59) of adults aged 18 and over supported the fluoridation of public drinking water, 23% (95% CI, 20-26) opposed the fluoridation of public drinking water and 21% (95% CI, 18-23) indicated they did not know whether they supported or opposed the fluoridation of public drinking water (see Figure 1).

Sex

- In 2011, there was no significant difference between the proportion of Ontario males and females who supported and opposed the fluoridation of public drinking water (see Figure 2).

Age Group

- In 2011, Ontario adults aged 18-24 were least likely to support the fluoridation of public drinking water. This age group also had the highest proportion of adults indicate that they did not know whether they supported or opposed the fluoridation of public drinking water. These differences, however, were not statistically significant (see Figure 3).

Health Unit

- In 2011, the proportion of adults who supported the fluoridation of public drinking water was significantly higher in Durham Region and Halton than in Ontario (see Table 1 and Figure 4).
- In 2011, the proportion of adults who opposed the fluoridation of public drinking water was significantly higher in Leeds, Grenville and Lanark than in Ontario (see Table 1 and Figure 4).
- In 2011, the proportion of adults who did not know whether they supported or opposed the fluoridation of public drinking water was significantly lower in Halton than in Ontario (see Table 1).

Figure 1: Support and Opposition to the Fluoridation of Public Drinking Water, Ontario Adults Aged 18 and Over, 2011

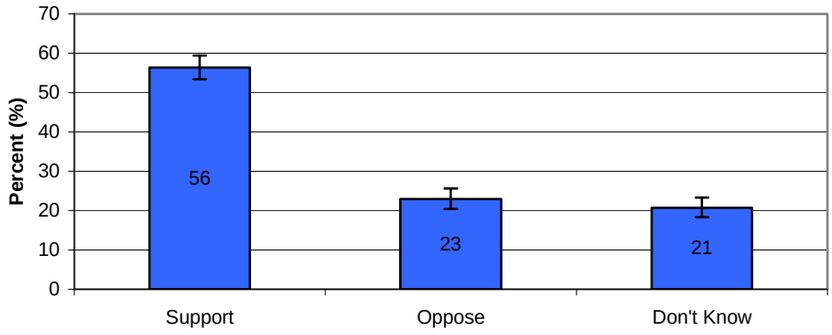
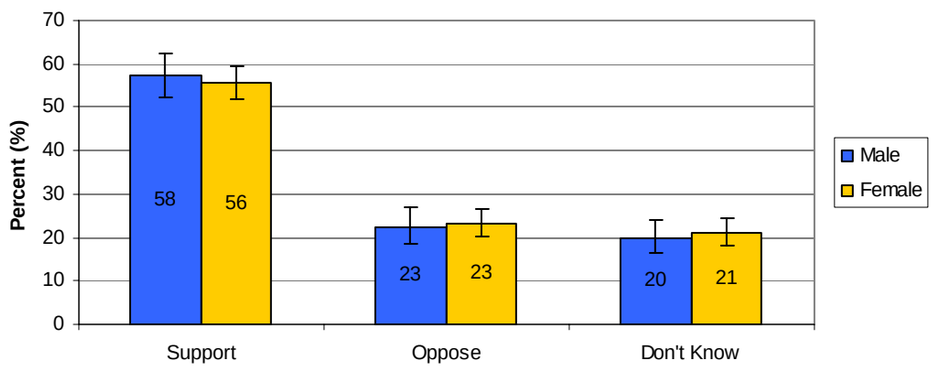


Figure 2: Support and Opposition to the Fluoridation of Public Drinking Water, Ontario Adults Aged 18 and Over, By Sex, 2011



A. RRFSS Provincial Sample Pilot Project (PSPP)

The RRFSS PSPP is intended to provide reliable and representative estimates for 2011 RRFSS indicators for Ontario as a whole, and in so doing:

- Provide a valid comparator for local health unit results for selected indicators;
- Allow for a reduction in RRFSS "core" content; and
- Provide a more flexible, timely system by which to collect provincially-relevant risk factor surveillance data than is currently available.

The provincial sample includes over 1800 interviews, with the number of interviews proportionate to the size of the health units' populations. Within households, the adult with the most recent birthday is selected to participate in the survey.

B. PSPP Evaluation

The evaluation of the RRFSS PSPP is supported by Locally-Driven Collaborative Project funding through Public Health Ontario.

The purpose of the PSPP evaluation is to summarize the implementation and results of the RRFSS PSPP, documenting what worked well and why, what the challenges were, what the benefits of the PSPP were and whether or not they were worth the costs.

The information will be used to inform decisions related to future provincial sampling in RRFSS.

C. Data Collection Period

January – December 2011
(Simcoe Muskoka District; Niagara; Peel; Halton; Leeds, Grenville and Lanark)

January – April 2011
(York)

May – August 2011
(Middlesex-London)

January – August 2011
(Haliburton, Kawartha, Pine Ridge)

May – December 2011
(Ontario; Durham Region)

Only RRFSS participating health units who asked this module and agreed to share their data have been included in this report.

D. Definitions

A 95% confidence interval (CI) refers to the range of values that has a 95% chance of including the 'true' estimate. A large CI means that there is a large amount of variability or imprecision. When CI's do not overlap, estimates are significantly different. CI's were selected as the measure of significance due to their conservative nature and transparency; there is less chance of incorrectly identifying a significant difference, which is important given the multiple tests of significance. CI's are reported in brackets or presented as I in the graphs. CI's for Ontario are also presented in Figure 4 using a dashed line (---).

Coefficient of variation (CV) refers to the precision of the estimate. When the CV is between 16.6 and 33.3, the estimate should be interpreted with caution because of high variability and has been marked with an asterisk (*). Estimates with a CV of 33.3 or greater are not reportable.

E. Limitations

RRFSS results are self-reported and may not necessarily be recalled accurately. Individuals not living in households (such as those in prison, hospitals, or the homeless) are excluded. Similarly, individuals who live in a household without a landline telephone (about 12% of all Ontario households[2]) will not be reached through RRFSS. Thus the percentages may not represent the true estimates for the general population as respondents may have different characteristics than people who have not been included in the survey.

Household (HH) weights were used for any questions related to individuals. The HH weight adjusts for the fact that adults from larger HH are less likely to be selected than individuals from smaller HH. Provincial results were also weighted to account for the actual distribution of adults among health units in Ontario. Estimates were multiplied by the 2006 population for the health unit to adjust for this difference.

Don't know and refused responses were excluded from the analysis.

Non-rounded estimates and confidence intervals were used when determining significant differences; however, rounded numbers were used for the presentation of data, thus estimates may not total 100 and confidence intervals may appear to overlap.

F. References

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Last Revised: June 26, 2012

Figure 3: Support and Opposition to the Fluoridation of Public Drinking Water, Ontario Adults Aged 18 and Over, By Age Group, 2011

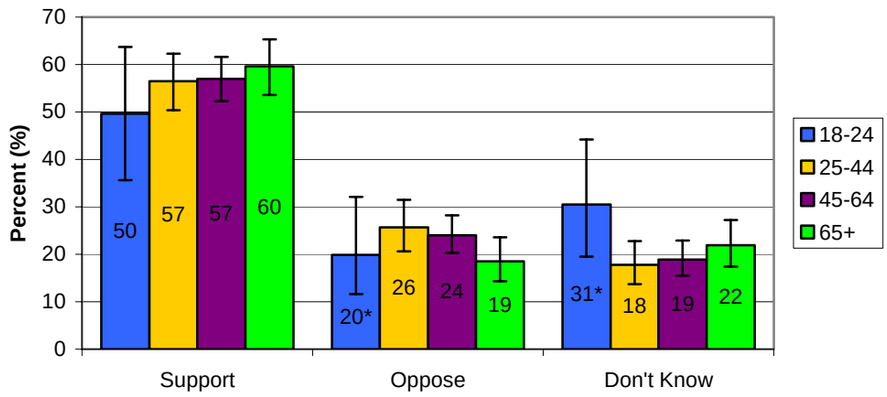

Table1: Support and Opposition to the Fluoridation of Public Drinking Water, Ontario Adults Aged 18 and Over, By Health Unit, 2011

Health Unit/Province	Support		Oppose		Don't Know	
	Percent (CI)	↑↓	Percent (CI)	↑↓	Percent (CI)	↑↓
ONTARIO	**56** (53-59)	-	**23** (20-26)	-	**21** (18-23)	-
Durham Region	65 (62-68)	↑	19 (17-22)		16 (14-19)	
Haliburton, Kawartha, Pine Ridge	57 (54-61)		24 (21-27)		19 (16-22)	
Halton	66 (64-69)	↑	19 (17-21)		15 (13-17)	↓
Leeds, Grenville and Lanark	52 (48-55)		30 (27-33)	↑	19 (16-22)	
Middlesex-London	62 (57-67)		20 (16-24)		18 (15-23)	
Niagara	57 (54-60)		24 (21-26)		19 (17-22)	
Peel	55 (52-58)		21 (19-24)		24 (22-27)	
Simcoe Muskoka District	56 (52-59)		25 (22-28)		19 (16-22)	
York	61 (56-66)		21 (17-25)		18 (14-23)	

Figure 4: Support and Opposition to the Fluoridation of Public Drinking Water, Ontario Adults Aged 18 and Over, By Health Unit, 2011