

Agenda Including Addeds

Civic Works Committee

3rd Meeting of the Civic Works Committee

February 5, 2019, 4:00 PM

Council Chambers

Members

Councillors P. Squire (Chair), M. van Holst, S. Lewis, S. Lehman, E. Pelozza, Mayor E. Holder

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The Committee will recess at approximately 6:30 PM for dinner, as required.

	Pages
1. Disclosures of Pecuniary Interest	
2. Consent	
2.1 1st Report of the Transportation Advisory Committee	3
2.2 Environmental Assessment and Design Services Dingman Drive East of Wellington Road to Highway 401 and Area Intersections - Appointment of Consulting Engineer	4
2.3 Tree Impacts for 2019 Infrastructure Renewal Program	11
2.4 2019 Large Diameter Watermain Inspection	15
2.5 2018 Ministry of the Environment, Conservation and Parks Inspection Report for the City of London Water Distribution System	24
3. Scheduled Items	
3.1 Item not to be heard before 4:10 PM - Community Water Fluoridation	
a. DELEGATION - K. Miller and C. Gupta - Safe Water London	58
b. PRESENTATION - Dr. Mackie - Middlesex London Health Unit	70
c. Additional Public Submissions	
a. R. Hudon, Safe Water Ottawa	105
b. K. Spencer	108
c. D. Mayne	124
d. C. Hibbs, Ontario Dental Assistants Association	131
e. A. Richard, Canadian Association of Public Dentistry	132
f. M. Carter, Ontario Dental Hygienists Association	134

g.	Dr. F. Rashid, Ontario Association of Public Health Dentistry	135
h.	O. Love, Canadian Dental Hygienists Association	138
i.	A. Sherban, Royal College of Dental Surgeons of Ontario	146
j.	Dr. H. Limeback, University of Toronto	150
k.	C. Massey	168
a.	<i>(ADDED) Additional Submission</i>	186
l.	Dr. R. Dickson, Safe Water Calgary	187
m.	M. Lucas	190
n.	Dr. M. Gross, London and District Dental Association	191
o.	<i>(ADDED) Saleem Family</i>	193
d.	Additional Request for Delegation Status	
a.	P. Killeen	201
b.	L Cianchino	209
a.	<i>(ADDED) Additional Submissions L. Cianchino</i>	289
b.	<i>(ADDED) Artificial Water Fluoridation</i>	307
c.	<i>(ADDED) Additional Submissions</i>	308
c.	N. Kuzmanovich	
d.	L. Timler, School of Health Sciences, Fanshawe College	
e.	M. Czechowicz	
4.	Items for Direction	
4.1	2nd Report of the Cycling Advisory Committee	384
4.2	Potential Transportation Projects	406
5.	Deferred Matters/Additional Business	
5.1	Deferred Matters List	407
5.2	<i>(ADDED) Green Bin Program - J. Kogelheide</i>	410
5.3	<i>(ADDED) Councillor van Holst - London Hydro Invitation</i>	412
6.	Adjournment	

Transportation Advisory Committee

Report

1st Meeting of the Transportation Advisory Committee
January 22, 2019
Committee Room #4

Attendance PRESENT: T. Khan (Acting Chair), S. Brooks, D. Doroshenko,
L. Norman and J. Scarterfield and J. Bunn (Committee
Secretary)

ABSENT: G. Bikas, G. Debbert, D. Foster, P. Moore, H.
Moussa and A. Stratton

ALSO PRESENT: M. Elmadhoon, Sgt. S. Harding, J. Kostyniuk,
T. Koza, T. Macbeth and A. Miller

The meeting stood adjourned at 12:45 PM, due to lack of
quorum.

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON FEBRUARY 5, 2019
FROM:	KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER
SUBJECT:	ENVIRONMENTAL ASSESSMENT AND DESIGN SERVICES DINGMAN DRIVE EAST OF WELLINGTON ROAD TO HIGHWAY 401 AND AREA INTERSECTIONS APPOINTMENT OF CONSULTING ENGINEER

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer, the following actions **BE TAKEN** with respect to the environmental assessment for Dingman Drive from east of Wellington Road to Highway 401, Exeter Road/Wellington Road intersection and Dingman Drive/White Oak Road intersection and design of localized minor roadworks at the Exeter Road/Wellington Road intersection:

- (a) AECOM Canada Ltd, **BE APPOINTED** Consulting Engineers for the project in the amount of \$431,324.00 (excluding HST), in accordance with Section 15.2(e) of the Procurement of Goods and Services Policy;
- (b) the financing for this project **BE APPROVED** in accordance with the Sources of Financing Report attached hereto as Appendix A;
- (c) the Civic Administration **BE AUTHORIZED** to undertake all the administrative acts that are necessary in connection with this project;
- (d) the approvals given herein **BE CONDITIONAL** upon the Corporation entering into a formal contract with the Consultant for the work; and,
- (e) the Mayor and City Clerk **BE AUTHORIZED** to execute any contract or other documents, if required, to give effect to these recommendations.

2015-19 STRATEGIC PLAN

The following report supports the Strategic Plan through the strategic focus area of *Building a Sustainable City*. The proposed Dingman Drive widening project, and improvements to Exeter Road/Wellington Road Intersection and Dingman Drive/White Oak Road Intersection are part of a strategic program of road improvements to provide improved mobility, capacity and safety for all road users.

BACKGROUND

Purpose

This report seeks the approval of the Municipal Council to retain an engineering consultant to undertake the environmental assessment (EA) for the widening of Dingman Drive from east of Wellington Road to Highway 401 from two lanes to four lanes and road improvements to Exeter Road/Wellington Road Intersection & Dingman Drive/White Oak Road intersection. The purpose of this EA is to satisfy the requirements of the Environmental Assessment Act by providing a comprehensive, environmentally sound planning process with public participation.

Context

The City requires a Municipal Class Environmental Assessment (EA) study for the anticipated road improvements in the study area. The EA is essential in order to proceed with the implementation strategy of transportation infrastructure needs for the Dingman Drive corridor, as recommended in the 2019 Development Charges Background Study currently in development.

The EA study will identify the needs and balance the requirements of the full range of potential users within the commercial/industrial area including motorists (light and heavy vehicles), pedestrians, cyclists, and transit vehicles. The design will need to reflect both the existing and planned land use, urban form and Complete Streets Design Manual. The EA will also evaluate implementation strategy, opportunities and constraints, needs, impacts, costs, and required mitigation measures.

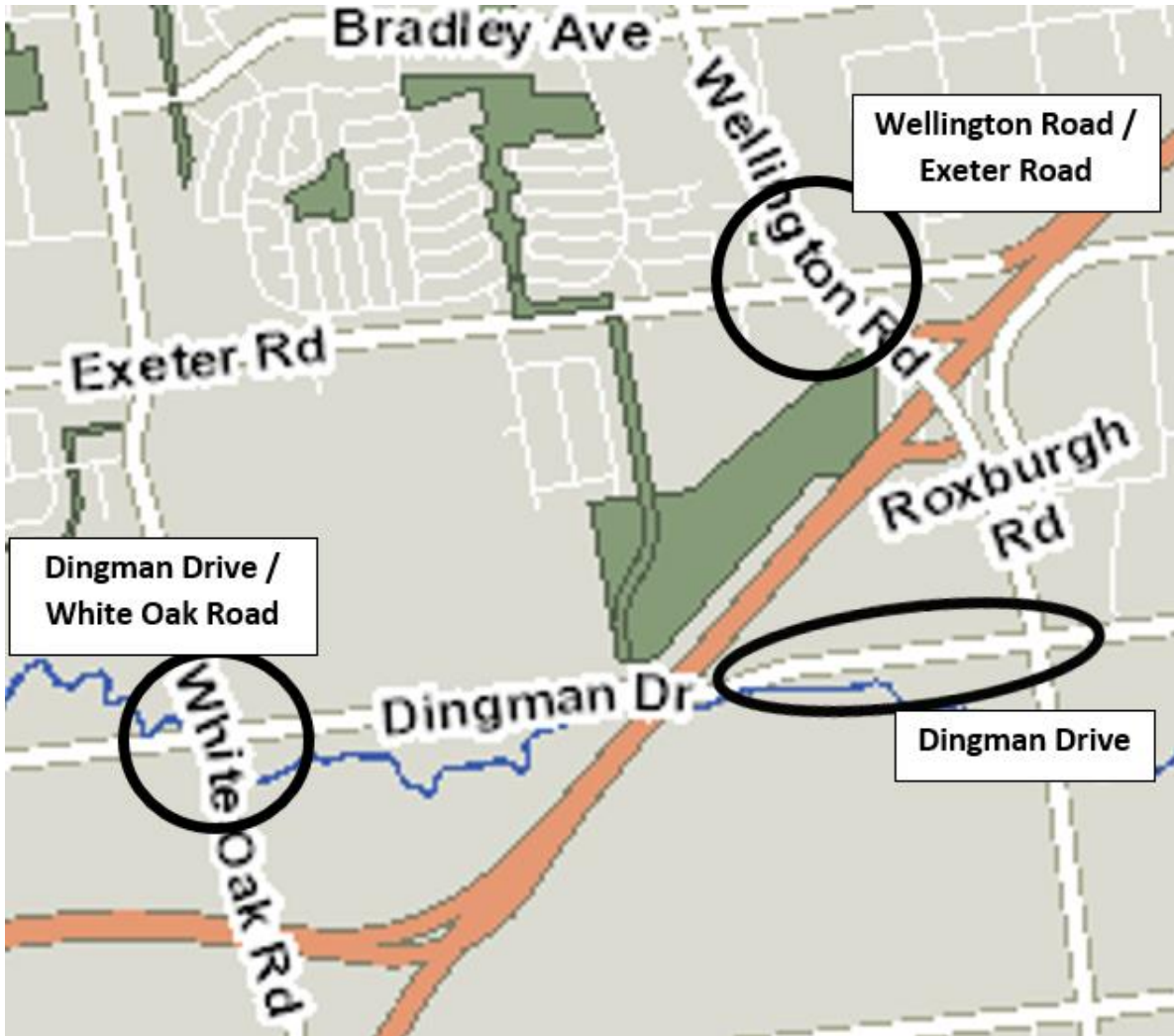
The EA must integrate technical considerations, public and stakeholder input, transportation engineering, structural engineering, land use planning, and urban design to develop a balanced and implementable solution.

DISCUSSION

Project Description

The Dingman Drive widening project is being considered as a priority project in the 2019 Transportation Development Charges Background Study (DCBS) currently in development due to the potential London Gateway development located at the southwest corner of Wellington Road and Highway 401. This development is expected to add a large amount of new retail and is anticipated to be completed in phases in the near term. Due to the anticipated large traffic volume generated by the development, improvements are required to widen Dingman Drive from 150 m east of Wellington Road to just east of Highway 401 overpass from two to four through lanes. The development will also have a direct impact on the intersections of Wellington Road & Exeter Road which will need to be assessed as part of this EA study. The intersection of Dingman Drive and White Oak Road is recommended for review as well.

It is worth noting that the Ministry of Transportation (MTO) is also reviewing opportunities to replace the Dingman Drive bridge over Highway 401 as part of a life-cycle renewal project. As part of the overpass replacement, consideration for a widened four-lane structure will be made. A map of the study areas is displayed below:



Environmental Assessment Study Areas

The intent of this EA is to explore various geometric design alternatives and develop a functional plan for the preferred designs. These alternatives will be evaluated using a range of criteria including impacts on the traffic, natural, social, cultural, and economic environments. The study corridor design should accommodate high volumes of vehicular traffic, be cycling and pedestrian supportive and provide safe access to the adjacent land uses.

The proposed EA will:

- Identify corridor improvements including intersection improvements as per the Complete Streets Design Manual, and other traffic capacity improvements;
- Coordination with the proposed development northwest of the Dingman Drive and Wellington Road intersection;
- Stormwater improvements, including urban treatment areas;
- Coordination with underground utilities (including but not limited to water, wastewater, storm, hydro, etc.);
- Urban design improvements to the corridor;
- Lighting/technology features;
- Identify property needs and cost estimates;
- Review and assess the transportation impact studies conducted for various developments in the area;
- Determine and recommend the appropriate right-of-way/ways and property requirements to accommodate the future widening of the subject section of

Dingman Drive including a potential roundabout at White Oak Road intersection and traffic capacity and geometric design improvements to the Wellington Road & Exeter Road intersection as per the London Plan and Complete Streets Design Manual;

- Evaluate cultural heritage resources;
- Engage the public and stakeholders to allow public input throughout the study process and ensure active involvement in developing the recommendations; and,
- Document in a clear and transparent manner the process undertaken and provide formal documentation and presentations.

Since the first phase of the proposed London Gateway development northwest of the Dingman Drive and Wellington Road intersection is tentatively scheduled to be opened in 2020, schedule and completion of this EA in a timely matter is very important.

Exeter Road & Wellington Road Intersection Minor Roadworks Design

Although the proposed EA will determine the long-term recommendations for the intersection improvements and replacement of underground services, localized minor roadworks are required in order to accommodate potential traffic generated by the London Gateway development. The required network improvements have already been identified in the transportation study conducted on behalf of the developer. This assignment includes the detailed design of the minor roadworks at the Wellington Road / Exeter Road intersection. The following are the key recommendations:

- An additional northbound left turn lane (for dual left turn lanes);
- Conversion of the exclusive northbound right turn lane into a shared through-right turn lane; and,
- Removal of right-turn lane islands.

The primary deliverables from this detailed design assignment include field investigations, design, approvals, and contract preparation. Particular focus areas for the assignment include:

- Traffic staging and construction access;
- Traffic signal design;
- Coordination of private utility relocation such as hydro poles where required;
- Provision for all road users including pedestrians, cyclists and truck traffic;
- Integration of landscaping / restoration; and,
- Businesses access.

Implementation is planned to begin in late 2019 or early 2020. The need to start the detailed design immediately has been deemed important in order to meet the opening date of the first phase of the proposed London Gateway development indicated in 2020. The potential increase in traffic emphasizes the need to expedite the process to complete the required road improvements in a timely matter.

Consultant Selection

The consultant selection process has been undertaken in accordance with the Procurement of Goods and Services Policy. The procurement followed the two stage process with the first stage being an open, publicly advertised expression of interest/pre-qualification stage (REOI/RFQUAL). Subsequently, a shortlist of six consultants were selected out of 11 RFQUAL consultant submissions. IBI Group,

Parsons Inc., AECOM, Stantec Consulting Ltd., WSP, and CIMA+ were asked to submit detailed proposals and work plans. All firms responded with written proposals including a summary of the project tasks, schedule, and costs. An evaluation committee reviewed the submissions for the project.

Based on the evaluation criteria and selection process identified in the request for proposal, the evaluation committee determined the proposal from AECOM Canada Ltd provides the best overall value to the City.

AECOM Canada Ltd has an experienced project team that exhibited a clear understanding of the project scope and requirements. Their experience on similar projects of this nature, combined with a project proposal that confirmed a thorough understanding of the goals and objectives, illustrated their expertise for this undertaking. The consultant project team is familiar with the challenges presented in this project having been involved in several past projects in the area and across London.

In accordance with Section 15.2 (e) of the Procurement of Goods and Services Policy, the civic administration is recommending AECOM Canada Ltd be appointed as the consulting engineer for the EA. The submission from AECOM Canada Ltd includes a fee submission that indicates that the EA and intersection design can be completed within available funds.

CONCLUSION

The EA for Dingman Drive widening and related intersections will provide alternative assessment and preliminary design for the preferred improvements to the existing roads. The preferred design will need to reflect both the existing and planned land use, urban form, and transportation contexts. The need for this environmental assessment and associated minor roadworks have been identified in coordination with the proposed London Gateway development and the anticipated high traffic volumes in the area.

Based on the technical evaluation of the proposals, it is recommended that AECOM Canada Ltd be awarded the consulting assignment for the environmental assessment and design of minor short-term roadworks. The consultant assignment is valued at an upset amount \$431,324.00 (excluding HST).

Acknowledgements

This report was prepared with assistance from Maged Elmadhoon, M.Eng., P.Eng. Traffic and Transportation Engineer, of the Transportation Planning & Design Division.

SUBMITTED BY:	RECOMMENDED BY:
DOUG MACRAE, P.Eng., MPA DIRECTOR, ROADS AND TRANSPORTATION	KELLY SCHERR, P.Eng., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL AND ENGINEERING SERVICES & CITY ENGINEER

Attach: Appendix A – Sources of Financing

c: Peter McAllister, P.Eng., PMP, AECOM Canada Ltd

APPENDIX "A"

Chair and Members
Civic Works Committee

#19009
February 5, 2019
(Appoint Consulting Engineer)

RE: Environmental Assessment and Design Services
Dingman Drive East of Wellington Road to Highway 401 and Area Intersections
Appoint Consulting Engineer
(Subledger RD190003)
Capital Project TS1522 - Dingman Drive/White Oak Road Intersection Improvements
Capital Project TS1576 - Exeter/Wellington Road Intersection Improvements
Capital Project TS1746 - Dingman Drive - 401 to Wellington
AECOM Canada Ltd. - \$431,324.00 (Excluding H.S.T.)

FINANCE & CORPORATE SERVICES REPORT ON THE SOURCES OF FINANCING:

Finance & Corporate Services confirms that the cost of this project cannot be accommodated with the financing available in the Capital Works Budget, and that, subject to the adoption of the recommendations of the Managing Director, Environmental & Engineering Services and City Engineer, the detailed source of financing for this project is:

<u>SUMMARY OF ESTIMATED EXPENDITURES</u>	<u>Approved Budget</u>	<u>This Submission</u>	<u>Revised Budget</u>
<u>TS1522 - Dingman Drive/White Oak Road Intersection Improvements</u>			
Engineering	\$0	\$113,760	\$113,760
<u>TS1576 - Exeter/Wellington Road Intersection Improvements</u>			
Engineering	0	211,394	211,394
<u>TS1746 - Dingman Drive - 401 to Wellington</u>			
Engineering	0	113,760	113,760
NET ESTIMATED EXPENDITURES	\$0	\$438,914 1)	\$438,914

SOURCE OF FINANCING

TS1522 - Dingman Drive/White Oak Road Intersection Improvements

Transfer From:			
TS144617 - Road Networks Improvements (Main)	\$0	\$13,160	\$13,160
Additional Drawdown from City Services - Roads Reserve Fund (Development Charges)	2) 0	100,600	100,600
	0	113,760	113,760

TS1576 - Exeter/Wellington Road Intersection Improvements

Transfer From:			
TS144617 - Road Networks Improvements (Main)	0	24,394	24,394
Additional Drawdown from City Services - Roads Reserve Fund (Development Charges)	2) 0	187,000	187,000
	0	211,394	211,394

TS1746 - Dingman Drive - 401 to Wellington

Transfer From:			
TS144617 - Road Networks Improvements (Main)	0	13,160	13,160
Additional Drawdown from City Services - Roads Reserve Fund (Development Charges)	2) 0	100,600	100,600
	0	113,760	113,760

TOTAL FINANCING **\$0** **\$438,914** **\$438,914**

1) <u>Financial Note:</u>	<u>TS1522</u>	<u>TS1576</u>	<u>TS1746</u>
Contract Price	\$111,793	\$207,738	\$111,793
Add: HST @13%	14,533	27,006	14,533
Total Contract Price Including Taxes	126,326	234,744	126,326
Less: HST Rebate	12,566	23,350	12,566
Net Contract Price	<u>\$113,760</u>	<u>\$211,394</u>	<u>\$113,760</u>

	Total
Contract Price	\$431,324
Add: HST @13%	56,072
Total Contract Price Including Taxes	487,396
Less: HST Rebate	48,482
Net Contract Price	<u>\$438,914</u>

2) Development charges have been applied in accordance with the Development Charges Act.

lp

Kyle Murray
Director of Financial Planning and Business Support

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING FEBRUARY 5, 2019
FROM:	KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR OF ENVIRONMENTAL AND ENGINEERING SERVICES & CITY ENGINEER
SUBJECT:	TREE IMPACTS FOR 2019 INFRASTRUCTURE RENEWAL PROGRAM

RECOMMENDATION

That, on the recommendation of the Managing Director of Environmental and Engineering Services & City Engineer, the following information concerning tree removal, mitigation, and communication as part of the 2019 Infrastructure Renewal Program **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

None.

2015-2019 STRATEGIC PLAN

The 2015 – 2019 Strategic Plan identifies this objective under Building a Sustainable City; 1B – Manage and improve our water, wastewater and stormwater infrastructure and services.

BACKGROUND

Purpose

The purpose of this report is to provide an overview of the tree removal identification and mitigation approach as part of the 2019 Infrastructure Renewal Program. The Infrastructure Renewal Program is generally funded by a combination of Wastewater, Water, and Transportation Capital Budgets.

Context

The London Plan includes strategies to increase protection, maintenance, monitoring, and planting of the urban forest. These strategies are applicable to City infrastructure projects and are actioned through an Environmental and Engineering Services Tree Strategy. This specific strategy meets the London Plan requirements by recognizing trees as municipal assets to be protected with specific measures during construction, their condition managed based on expert evaluation of health and structural condition, and a robust post-construction planting plan.

DISCUSSION

The City is committed to maintaining strong and healthy infrastructure above and below ground. There are a number of large construction projects currently planned for 2019. The Infrastructure Renewal Program is an annual program intended to replace municipal infrastructure that has reached the end of its service life. Typically, about 10 to 15 construction projects are assigned to City design teams and engineering consultants every year to help deliver this annual program.

These projects generally include sanitary and storm sewer reconstruction, watermain reconstruction, road restoration, replacement of curb and gutter and sidewalk, as well as restoration of areas disturbed by construction. The scope of each project varies in length, excavation depth and extent of infrastructure replacement.

Generally, Infrastructure Renewal Program projects are situated in older areas of the City. Each of the projects have work plans that include the required engineering design plan to complete the project. In addition, all projects require the design consultant to retain an arborist to analyze all trees on City Right-Of-Way within the project limits, support tree decisions for that project, prepare a Tree Inspection Report, and assist in the creation of tree protection plans. The City has adopted standards for tree protection during construction.

To ensure consistency within the Infrastructure Renewal Program, the City has an internal tree protection strategy to manage the design and implementation of construction projects with respect to trees on public property. This document covers project design considerations, public relations, construction, and tree protection measures, as well as standards for tree planting and preservation.

It is noted that an arborist is hired for each individual Infrastructure Renewal Program contract to assess each tree in the City Right-Of-Way within the project limits. This assessment includes the determination of the health and the impact of construction activities for each tree. A Tree Inspection Report is prepared for each project which provides recommendations for tree removal/retention.

All trees within the Right-Of-Way are visually evaluated to assess health and structural integrity. Evaluated trees are reviewed for health risk status based on the International Society of Arboriculture standards. Generally, most are deemed suitable for retention, pending decisions regarding the construction footprint. However, some can be deemed unhealthy, high risk, or have a limited life span and are not suitable to keep.

For 2019, in addition to identification of trees required for removal, staff have also identified trees which may have to be removed following post construction assessment. These trees will be retained during construction but due to the unknown extent and location of major roots, could be at risk of requiring removal, noting that the intent is to keep these trees. All required and potential tree removals are being communicated to property owners within the project limits through homeowner letters and invitation to Project Update Meetings.

Following construction, the City's Forestry Co-ordinator will review the tree inventory on those streets. At that time, a determination will be made on the number and species of trees that will be replanted based on available space and planting guidelines. Generally, the City plants trees after construction in every viable planting location. About 300 to 400 trees get planted on reconstructed streets per year.

The following table provides a listing of the 2019 Infrastructure Renewal Program projects which have proposed tree removals. It is noted that large trees have been defined as trees with a trunk diameter of 30cm (12 inches) or more. Small trees have a trunk diameter of less than 30cm.

PROJECT	TOTAL # OF TREES ASSESSED	REMOVAL REQUIRED	REMOVAL MAY BE REQUIRED	% Removal
York Street (Talbot – Clarence)	34	0 Large 22 Small	0 Large 0 Small	65%
Wistow Street (Landor Street – Oxford Street East)	67	11 Large 3 Small	4 Large 0 Small	21-27%
Egerton Street (Brydges Street – Ormsby Street) Brydges Street (Egerton Street – Douglas Court) Pine Street (Egerton Street – Oak Street)	47	4 Large 8 Small	0 Large 0 Small	25.5%
Devonshire Avenue (Edward Street – Cathcart Street) Devonshire Place (all) Cathcart Street – Devonshire Avenue to Emery Street East)	69	7 Large 1 Small	12 Large 0 Small	11-29%
Cavendish Crescent (Wyatt Street to Riverside Avenue) Mount Pleasant Avenue (Riverside Avenue – Charles Street)	56	13 Large 5 Small	0 Large 0 Small	32%
Avalon Street (all) Parkhurst Park South*	96	0 Large 0 Small	0 Large 0 Small	0%
Canterbury Road (Windermere Road – Richmond Street) Westchester Drive (Canterbury Road – Richmond Street)	65	15 Large 0 Small	11 Large 0 Small	23-40%
Roehampton Avenue (all) Monsarrat Avenue (Belfield Street - Gatewood Road)	67	6 Large 4 Small	4 Large 0 Small	15-21%
Wellington Street (Grosvenor Street – Victoria Street)	97	9 Large 5 Small	0 Large 0 Small	14%
Waterloo Street (Oxford Street – Grosvenor Street)	114	7 Large 1 Small	0 Large 0 Small	7%
Regal Dr (Magnolia Cres West – Fuller St East)	101	16 Large 10 Small	0 Large 0 Small	26%
Champlain Cres (Cartier Rd – Frobisher Cres) Frobisher Cres (Champlain Cres – Hudson Dr)	90	23 Large 0 Small	0 Large 0 Small	26%

*There are a number of mostly small trees which need to be removed in the south side of Parkhurst Park South. Engineering staff have met on site with Forestry Operations staff and determined that these tree removals are not considered to create an impact to the park.

At this time, 170 trees are scheduled to be removed in 2019 alongside streets. This includes trees of various sizes and removal is required due to either their high risk nature, construction conflict, poor health, or short life expectancy. These tree removals are spread across twelve (12) construction projects.

Forestry Operations will be removing all required tree removals over the winter months to ensure all trees are removed prior to the start of construction.

Communications Plan

The social impact is being mitigated through design team coordination and public communication. In an effort to ensure continuity within the program, the specific communication strategies for the various projects include:

- Homeowner Letter Pre Construction Notice, which is sent approximately two weeks prior to the Project Update Meeting, describes the tree impact that is anticipated, with further information to be available at the Project Update Meeting on tree conditions and removals.
- Tree removals will be shown on plans and discussed at the Project Update Meeting. The difference between construction removals and health and safety trees or end of life is highlighted. The tree arborist is typically present at the Project Update Meeting, especially for projects with a high number of tree removals.

CONCLUSIONS

Trees are an important asset to the City of London and best efforts are being made to protect them during construction. The final number of trees slated for removal may change, recognizing that tree location may conflict with the installation of water services and private drain connections. Considerable effort will be made to minimize impact of construction on any tree.

All design assignments within the 2019 Infrastructure Renewal Program include Tree Inspection Reports, meaning that all trees within the Right-Of-Way are visually evaluated by an arborist to assess health and structural integrity against international standards. Homeowners are kept informed of the extent and impact of tree removals through multiple communication efforts. The City’s Forestry Division will assess all streets with tree removals and initiate replanting efforts in subsequent years.

Acknowledgements

This report was prepared within the Wastewater and Drainage Engineering Division by Kyle Chambers, P. Eng., Environmental Services Engineer

SUBMITTED BY:	SUBMITTED BY:
TOM COPELAND, P. ENG. DIVISION MANAGER WASTEWATER AND DRAINAGE ENGINEERING	AARON ROZENTALS, P.ENG. DIVISION MANAGER WATER ENGINEERING DIVISION
REVIEWED AND CONCURRED BY:	RECOMMENDED BY:
SCOTT MATHERS, MPA, P.ENG. DIRECTOR, WATER AND WASTEWATER ENGINEERING	KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR ENVIRONMENTAL AND ENGINEERING SERVICES AND CITY ENGINEER

January 28, 2019
KJC/kjc

cc. Doug McRae
Ugo DeCandido

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON FEBRUARY 5, 2019
FROM:	KELLY SCHERR, P. ENG., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL AND ENGINEERING SERVICES & CITY ENGINEER
SUBJECT:	2019 LARGE DIAMETER WATERMAIN INSPECTION

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental and Engineering Services & City Engineer, the following actions **BE TAKEN** with respect to the Large Diameter Watermain Inspection:

- (a) The bid submitted by Echologics Engineering Ltd., 6295 Northam Drive, Mississauga, Ontario, L4V 1W8, in the amount of \$874,649 (excluding H.S.T.) **BE AWARDED** in accordance with Section 15.2 (e) of the City of London's Procurement of Goods and Services Policy;
- (b) The contract value for Pure Technologies Ltd., 3rd Floor, 705-11 Avenue SW, Calgary, Alberta, T2R 0E3, in the amount of \$744,582 (excluding H.S.T.) **BE APPROVED**, in accordance with section 14.4 (e) of the Corporation of the City of London's Procurement of Goods and Services Policy;
- (c) The financing for this project **BE APPROVED** as set out in the Sources of Financing Report attached hereto as Appendix "A";
- (d) The Civic Administration **BE AUTHORIZED** to undertake all the administrative acts that are necessary in connection with this project; and
- (e) The Mayor and City Clerk **BE AUTHORIZED** to execute any contract or other documents, if required, to give effect to these recommendations.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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- Large Diameter Watermain Inspection – Elgin Pipeline, October 24, 2017, Civic Works Committee.
- Long-Term Large Diameter Pipe Inspection Strategy and Single Source Procurement, July 21, 2014, Civic Works Committee.
- Concrete Pressure Pipe Inspection Fiber Optic Installation – Amendment of Existing Contract, May 29, 2012, Civic Works Committee.
- Sole Source: EW3717 Concrete Pressure Pipe Inspection – Fiber Optic Installation, April 14, 2010, Board of Control.
- Water System Risk Management Exercise and Evaluation, April 23, 2007, Environment and Transportation Committee.

2015-2019 STRATEGIC PLAN

This report supports the Strategic Plan in the following areas:

- Building a Sustainable City: robust infrastructure; strong and healthy environment; responsible growth.
- Leading in Public Service: Open, accountable and responsive government; excellent service delivery.

BACKGROUND

Purpose

This report recommends that Echologics be appointed as the consultant to undertake the large diameter watermain inspection of the Adelaide Street, Clarke Road, and Dingman Drive pipelines. This report also recommends that Pure Technologies be appointed as the consultant to undertake the large diameter watermain inspection of the Horton Street pipeline.

Context

The City of London's trunk watermains are critical infrastructure in London's water supply system. The trunk watermains supply water to the smaller diameter pipelines which in turn supply water to individual customers. The City's trunk watermains are critical infrastructure that ensure adequate water supply and reliability for customers.

Inspection of the City's trunk watermains will secure the reliability of the City of London's water supply and allow staff to make informed decisions regarding condition and need for repair. This year's annual inspection will identify the need to carry out maintenance on the trunk watermains which will reduce the potential for catastrophic watermain breaks in the future.

DISCUSSION

The City's annual trunk watermain inspection program involves inspection of approximately 10 km of trunk watermain every year. This will allow the City to inspect every trunk watermain in the City over a period of 20 years. The decision of which sections of pipeline are to be inspected each year is based on pipe age, pipe material, criticality, and anticipated construction projects for that section.

For the 2019 inspection program, four sections of pipe were identified for inspection with a total length of 15 km. Horton Street (7.5 km), Adelaide Street (1 km), Clarke Road (4.5 km), and Dingman Drive (2 km) were identified to be inspected in 2019 in advance of major infrastructure projects in order for staff to make informed decisions regarding the infrastructure replacement needs. The inspection locations are shown in the attached Appendix 'B' maps.

Procurement Process

The 2019 inspections were divided into two assignments; one request for proposal (RFP) assignment and one single source assignment in accordance with section 14.4 (e) of the City of London's Procurement of Goods and Services Policy. The first assignment includes a water main on Horton Street. The sensitive location and the age of Horton Street watermain requires specialized technology that is only available from Pure Technologies. The Horton Street watermain is located in London's downtown core and also extends through Springbank Park and adjacent to the Thames River. Pure Technologies' exclusive technology will provide the highest level detailed condition assessment information while also requiring minimal disturbance to traffic and the sensitive features in proximity to the watermain like the Thames River, a large retaining wall, and natural heritage features. This technology uses a device that can be inserted in the pipe to assess its condition over long distances while only creating the need to access the pipe at the insertion and extraction points. Some other inspection technologies require frequent access to the pipe throughout the length being assessed.

The second assignment includes watermains on Adelaide Street, Clarke Road, and Dingman Drive. These watermains were assessed and it was determined that a number of different technologies and technology providers would be able to provide the desired level of inspection. This decision was based on the relative age of the watermains and the locations of these three watermains, which are mostly located in the boulevards of

rural roads. In November of 2018, three engineering firms responded to an open request for proposal (RFP) in accordance with section 15.2 (e) of the City of London's Procurement of Goods and Services Policy. After evaluation of the RFP, the City's evaluation team determined that Echologics provided the best value and their technology presented the least amount of operational risk.

Project Costs

Echologics proposal for the inspection of the Adelaide Street, Clarke Road, and Dingman Drive watermains includes a fee submission of \$874,649 (excluding H.S.T.). The technical proposal and fee submission was evaluated in accordance with the City of London's Procurement of Goods and Services Policy and it was found that the proposal met all of the key project requirements and provided the best value to the City for inspection services of the Adelaide Street, Clarke Road, and Dingman Drive watermains.

Pure Technologies' proposal for inspection of the Horton Street watermain includes a fee submission of \$744,582 (excluding H.S.T.). The technical proposal and fee submission was evaluated in accordance with the City of London's Procurement of Goods and Services Policy and it was found that the proposal met all of the key project requirements and provided the best value to the City for inspection services of the Horton Street Watermain.

CONCLUSIONS

Echologics and Pure Technologies both have experience undertaking similar work of this caliber while providing useful and actionable information for large diameter watermain repairs. Both of the proposed consulting teams have extensive experience with similar work and is well qualified to undertake the required inspections.

Based on the results of the Adelaide Street, Clarke Road, and Dingman Drive RFP and based on the review by the evaluation team, it is determined that retaining Echologics is in the best financial and technical interests of the City. It is recommend that Echologics be awarded this contract in the amount of \$874,649 (excluding H.S.T.) to undertake all tasks related to the large diameter watermain inspection of the Adelaide Street, Clarke Road, and Dingman Drive pipelines.

Based on Pure Technologies' specific technology and experience, it is determined that retaining Pure Technologies for the Horton Street watermain inspection is in the best financial and technical interests of the City. It is recommend that Pure Technologies be awarded this contract in the amount of \$744,582 (excluding H.S.T.) to undertake all tasks related to the large diameter watermain inspection of the Horton Street pipeline.

Acknowledgements

This report was prepared by Michelle Morris, E.I.T, of the Water Engineering Division.

PREPARED BY:	REVIEWED & CONCURRED BY:
AARON ROZENTALS, P. ENG. DIVISION MANAGER, WATER ENGINEERING	SCOTT MATHERS, MPA, P. ENG. DIRECTOR, WATER AND WASTEWATER
RECOMMENDED BY:	
KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER	

January 24, 2019

Attach: Appendix "A" – Sources of Financing
Appendix "B" – Project Location

CC.

John Freeman – Manager, Purchasing & Supply
Chris Ginty – Procurement Officer
Gary McDonald – Budget Analyst, Finance & Corporate Services
Michelle Morris, E.I.T, Water Engineering

APPENDIX 'A'

#19008

Chair and Members
Civic Works Committee

February 5, 2019
(Award Contract)

**RE: 2019 Large Diameter Watermain Inspection
(Subledger NT19EW03)
Capital Project EW371718 - Inspect Trunk Concrete Pressure Pipes
Echologics Engineering Ltd. - \$874,649 (excluding H.S.T.)
Pure Technologies Ltd. - \$744,582 (excluding H.S.T.)**

FINANCE & CORPORATE SERVICES REPORT ON THE SOURCE OF FINANCING:

Finance & Corporate Services confirms that the cost of this project can be accommodated within the financing available for it in the Capital Works Budget and that, subject to the adoption of the recommendations of the Managing Director, Environmental and Engineering Services and City Engineer, the detailed source of financing for this project is:

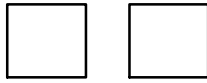
<u>ESTIMATED EXPENDITURES</u>	<u>Approved Budget</u>	<u>Committed To Date</u>	<u>This Submission</u>	<u>Balance for Future Work</u>
Engineering	\$200,000	\$146,270		\$53,730
Construction	3,025,000		1,647,729	1,377,271
City Related Expenses	40,059			40,059
NET ESTIMATED EXPENDITURES	<u>\$3,265,059</u>	<u>\$146,270</u>	<u>\$1,647,729</u> 1)	<u>\$1,471,060</u>
<u>SOURCE OF FINANCING:</u>				
Capital Water Rates	\$2,980,353	\$146,270	\$1,647,729	\$1,186,354
Drawdown from Capital Water Reserve Fund	284,706			284,706
TOTAL FINANCING	<u>\$3,265,059</u>	<u>\$146,270</u>	<u>\$1,647,729</u>	<u>\$1,471,060</u>

Financial Note:

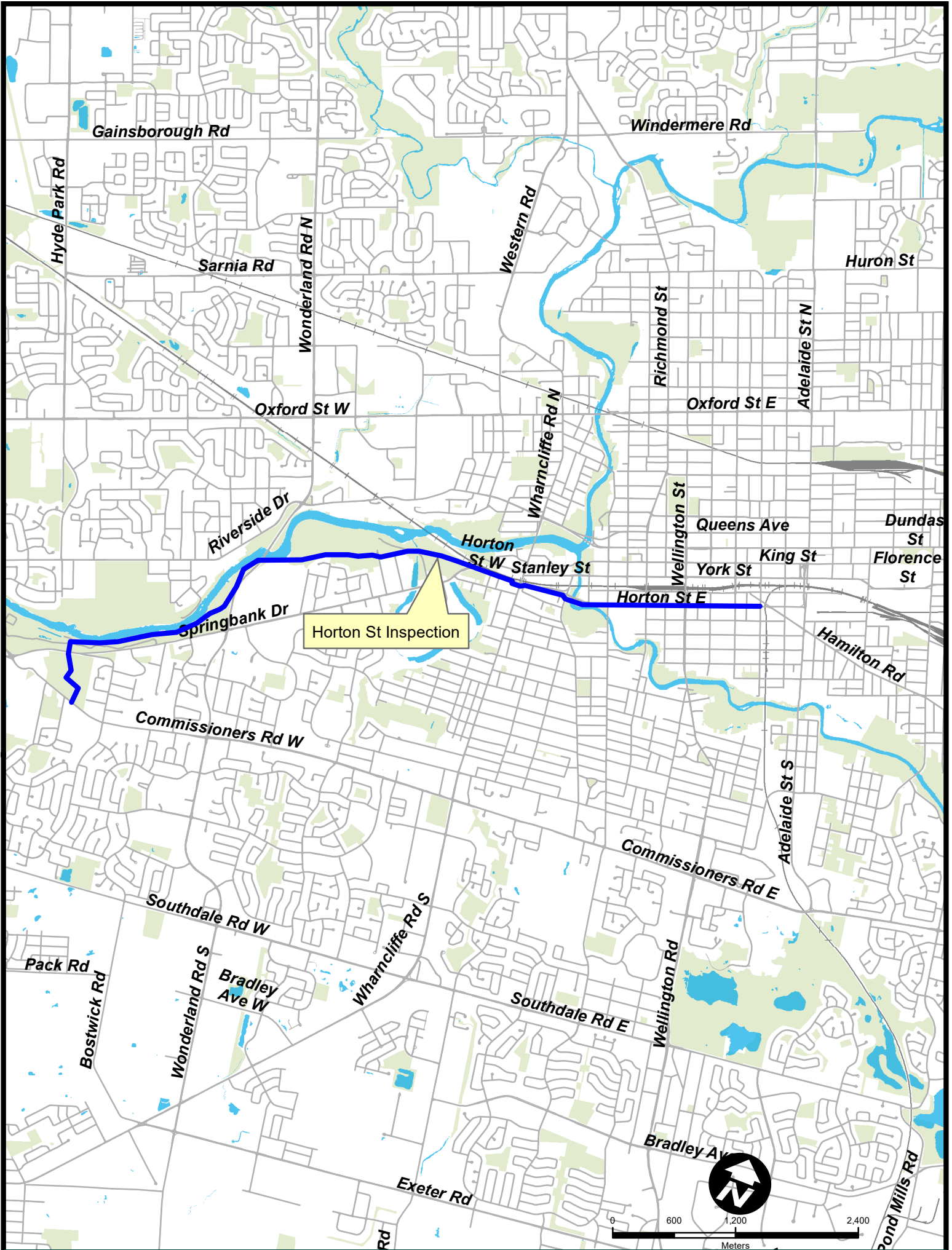
	<u>Echologics</u>	<u>Pure Technologies</u>	<u>Total</u>
1) Contract Price	\$874,649	\$744,582	\$1,619,231
Add: HST @13%	113,704	96,796	210,500
Total Contract Price Including Taxes	988,353	841,378	1,829,731
Less: HST Rebate	98,311	83,691	182,002
Net Contract Price	<u>\$890,042</u>	<u>\$757,687</u>	<u>\$1,647,729</u>

JG

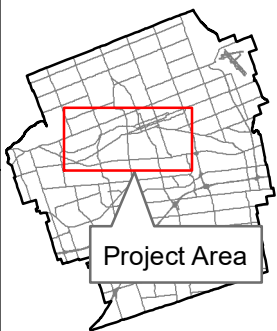
Jason Davies
Manager of Financial Planning & Policy








APPENDIX 'B'



HORTON STREET, MAITLAND STREET TO COMMISSIONERS ROAD WEST



Legend:

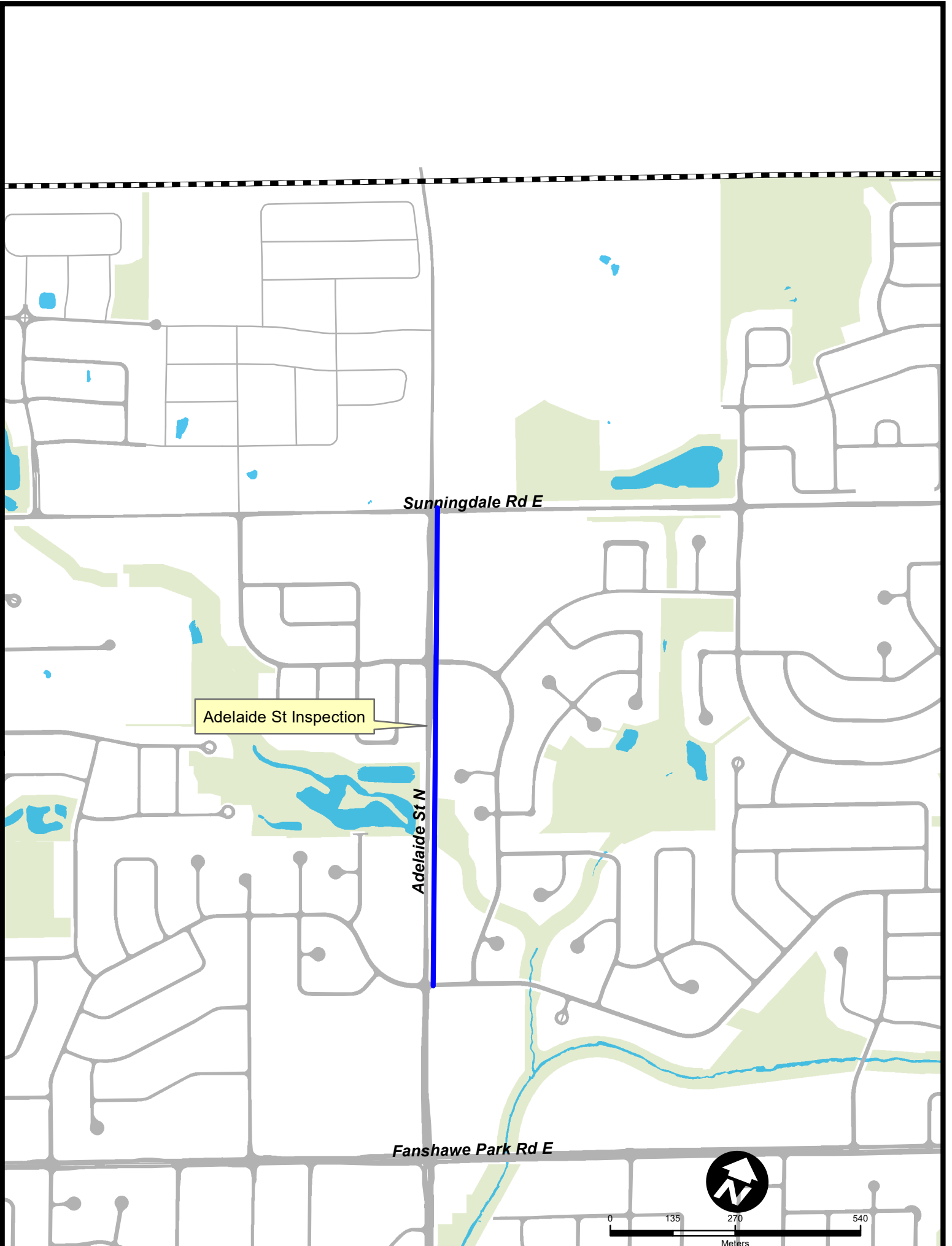
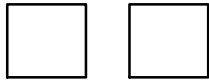
-  Watermain Inspection
-  Water Body
-  Road
-  Railroad
-  Parks

Map Produced by Water Engineering Division

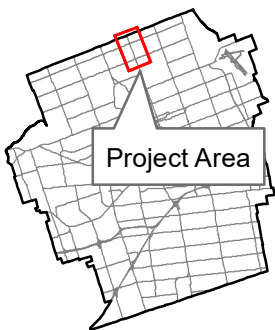
October 18th, 2018








London
CANADA
300 Dufferin Avenue,
PO Box 5035
London, Ontario
N6A 4L9
www.London.ca



ADELAIDE STREET, SUNNINGDALE ROAD EAST TO GRENFELL DRIVE



Legend:

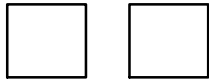
-  Watermain Inspection
-  Road
-  Railroad
-  Water Body
-  Parks

Map Produced by
Water Engineering
Division

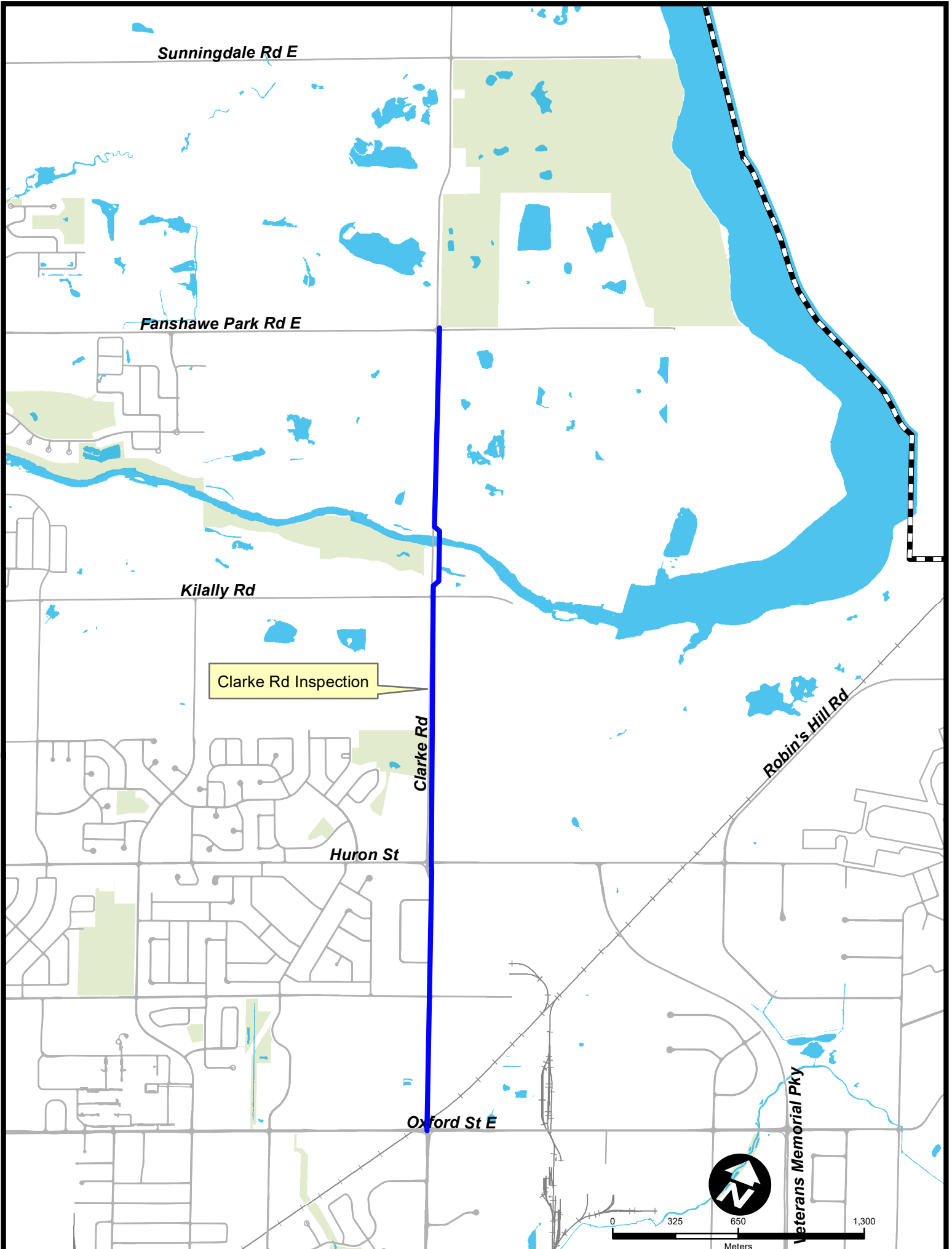
October 18th, 2018



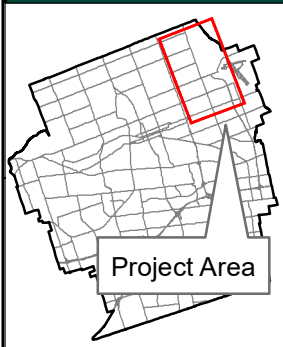
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APPENDIX 'B'



CLARKE ROAD, FANSHAWE PARK RD EAST TO OXFORD ST EAST



Legend:

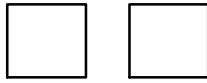
-  Watermain Inspection
-  Road
-  Railroad
-  Water Body
-  Parks

Map Produced by
Water Engineering
Division

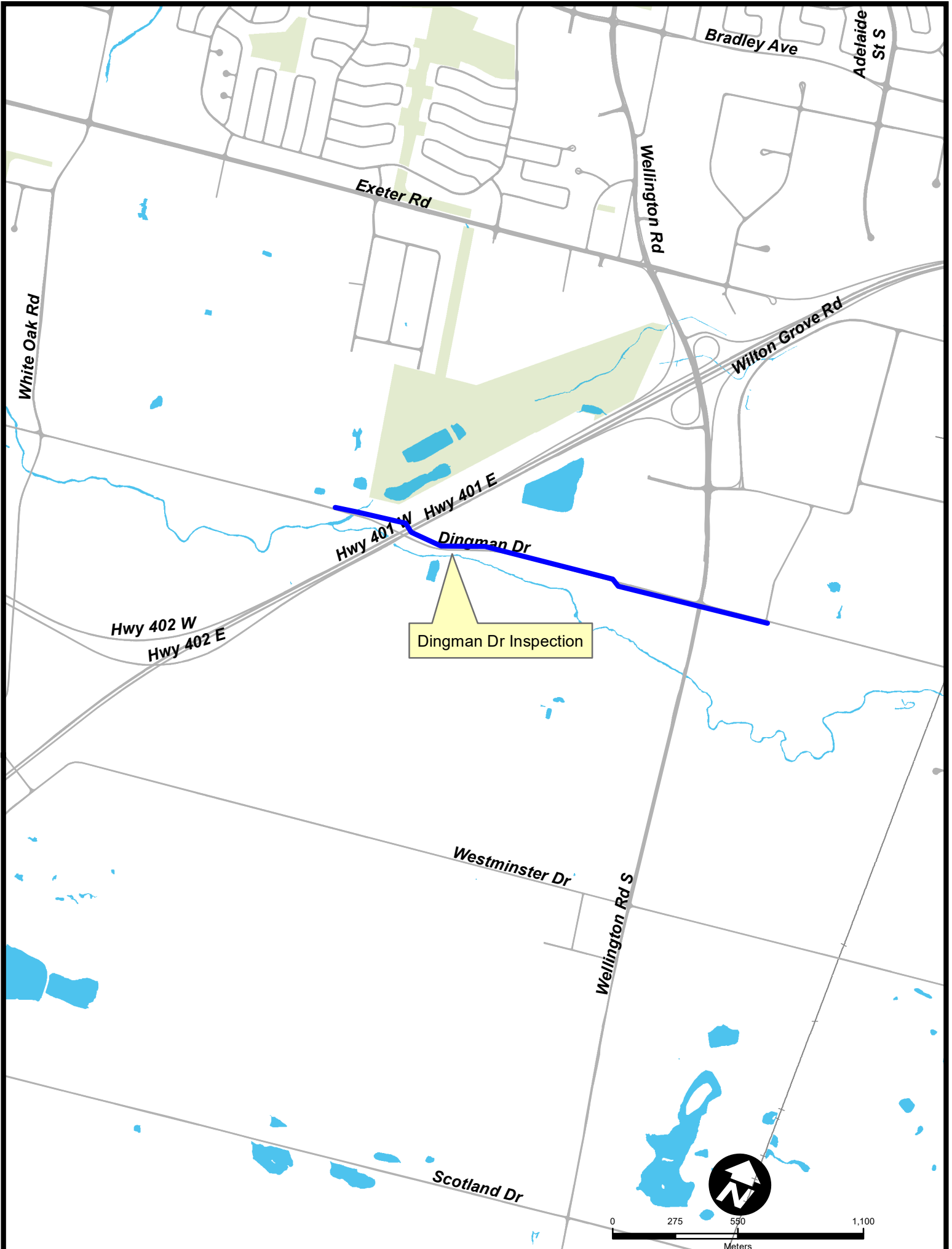
October 18th, 2018



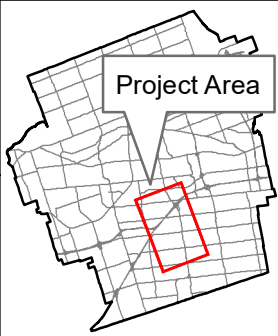
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www.London.ca








APPENDIX 'B'



DINGMAN DRIVE, WEST OF 401 TO CASTLETON ROAD



Legend:

-  Watermain Inspection
-  Road
-  Railroad
-  Water Body
-  Parks

Map Produced by Water Engineering Division

October 18th, 2018



London
CANADA
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PO Box 5035
London, Ontario
N6A 4L9
www.London.ca

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON FEBRUARY 5, 2019
FROM:	KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER
SUBJECT:	2018 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS INSPECTION REPORT FOR THE CITY OF LONDON WATER DISTRIBUTION SYSTEM

RECOMMENDATION

That on the recommendation of the Managing Director – Environmental & Engineering Services and City Engineer, this report regarding the findings of the 2018 Ministry of the Environment, Conservation and Parks Inspection of the City of London Water Distribution System **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

“2016 Ministry of the Environment and Climate Change Inspection Report for the City of London Water Distribution System”, Civic Works Committee, February 7, 2017, Agenda item #8.

“2017 Ministry of the Environment and Climate Change Inspection Report for the City of London Water Distribution System”, Civic Works Committee, February 6, 2018, Agenda item #12.

2015-2019 STRATEGIC PLAN

This report supports the Strategic Plan in the following areas:

- Building a Sustainable City: robust infrastructure; strong and healthy environment; responsible growth.
- Strengthening our community: healthy, safe, and accessible City.

BACKGROUND

Purpose

The purpose of this report is to outline the results of the 2018 MECP City of London Water Distribution System inspection, which was conducted in December, 2018.

Context

Municipal drinking water systems in Ontario are held to very high standards. The Ontario Ministry of the Environment, Conservation and Parks (MECP) ensures that these standards are met by requiring municipal water systems to conform to the Province’s Drinking Water Quality Management Standard and through annual inspections. The MECP performs inspections to ensure that municipalities are operating water systems in compliance with all applicable legal requirements. Water system

operations are governed by provincial regulations and by the conditions prescribed in MECP-issued Drinking Water Works Permits and Municipal Drinking Water Licences.

DISCUSSION

MECP inspections can be in the form of rigorous “detailed” inspections, or less stringent “focused” inspections. For 2018, the MECP conducted a focused inspection in London, and explained the decision as follows:

“This system was chosen for a focused inspection because the system’s performance met the ministry’s criteria, most importantly that there were no deficiencies as identified in O. Reg. 172/03 over the past 3 years.”

O. Reg. 172/03 defines a deficiency as a violation that poses a drinking water health hazard. MECP inspections include staff interviews and facility inspections, as well as a review of operating procedures, water analysis reports, operational records, and staff certification and training records. Where an Inspector finds that the water system operators did not properly comply with the applicable requirements, these are recorded as non-compliance incidents.

The results of the annual MECP Inspections are used to generate Drinking Water System Inspection Rating Records. Each incident of non-compliance results in a subtraction from a possible score of 100%. Each year, these rating records (or “report cards”) for Ontario drinking water systems are compiled and made available to the public.

On January 9, 2019, the MECP issued the *City of London Distribution System Inspection Report* for the 2018 inspection. After completing the inspection, the MECP identified one incident of administrative non-compliance. The non-compliance was related to a requirement to contact the Medical Officer of Health within 24 hours of receiving a report of a lead exceedance in a water sample. These results from London’s residential testing program were received by the City of London on December 28, 2017. London’s residential testing program provides scheduled sampling of older homes that are known to have lead water service pipes. City staff provided the results to the MLHU on January 3, 2018. As detailed in the Inspection Report, the results were not provided within 24 hours of being received.

The MECP deemed this single incident of administrative non-compliance to have a Risk Rating of zero, and the City of London received a Final Inspection Rating of 100.00% for 2018.

The following summarizes London’s Final Inspection Ratings for the last 5 years:

- 2014 – 98.98%
- 2015 – 100.00%
- 2016 – 96.05%
- 2017 – 84.06%
- 2018 – 100.00%

The complete 2018 *City of London Distribution System Inspection Report* has been included as Appendix ‘A’: Inspection Report, and is also available at:

www.london.ca/residents/Water/Water-System/Pages/Summary-and-Annual-Reports.aspx

CONCLUSIONS

The Ontario Ministry of the Environment, Conservation and Parks (MECP) performs rigorous annual inspections to ensure that municipalities are operating water systems in compliance with all applicable legal requirements. The MECP recently completed the 2018 inspection of London’s drinking water system, and outlined the findings in the *City of London Distribution System Inspection Report*.

London received a final inspection rating of 100.00% for the 2018 MECP inspection.

Acknowledgements

This report has been prepared with input from Dan Huggins, Water Quality Manager and QMS Representative.

PREPARED BY:	REVIEWED & CONCURRED BY:
JOHN SIMON, P.ENG. DIVISION MANAGER, WATER OPERATIONS	SCOTT MATHERS, P.ENG. DIRECTOR - WATER AND WASTEWATER
RECOMMENDED BY:	
KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR OF ENVIRONMENTAL AND ENGINEERING SERVICES AND CITY ENGINEER	

- Attach: Appendix 'A': Inspection Report
- CC: Martin Hayward – City Manager
 Aaron Rozentals – Division Manager, Water Engineering
 Dan Huggins - Water Quality Manager

**Ministry of the Environment,
Conservation and Parks**

Drinking Water and Environmental
Compliance Division
Southwest Region
733 Exeter Road
London, ON N6E 1L3
Tel (519) 873-5000

**Ministère de l'Environnement, de la Protection
de la nature et des Parcs**

Division de la conformité en matière d'eau potable et
d'environnement
Région Sud-Ouest
733, rue Exeter
London, ON N6E 1L3
Tel (519) 873-5000



January 9, 2019
The Corporation of the City of London
300 Dufferin Avenue
London, ON N6A 4L9

File no. SI-MI-LN-DU-540

Attention: Mr. John Simon – Division Manager – Water Operations

Re: City of London Distribution System (WW# 260004917)
Inspection conducted on December 10, 2018

Dear Mr. Simon,

The enclosed Drinking Water Inspection Report outlines non-compliance, if any, with Ministry legislation, and policies for the above noted water system. Violations noted in this report, if any, have been evaluated based on community risk. These violations will be monitored for compliance with the minimum standards for drinking water in Ontario as set forth under the *Safe Drinking Water Act* and associated regulations. Where risk is deemed to be high and/or compliance is an ongoing concern, violations will be forwarded to this Ministry's Investigation and Enforcement Branch.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance.

Section 19 of the *Safe Drinking Water Act* (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councillors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in "*Taking Care of Your Drinking Water: A guide for members of municipal council*" found under "Resources" on the Drinking Water Ontario website at www.ontario.ca/drinkingwater.

Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Mark Smith, Drinking Water Program Supervisor, at (519) 873-5122.

Please note that as of June 29, 2018 the Ministry of the Environment and Climate Change's name has changed to the Ministry of Environment, Conservation and Parks. This name change will take some time to be reflected in ministry materials and systems.

If you have any questions regarding the report, please feel free to call me at (519) 873-5065.

Yours truly,

Neville Rising, P.Eng.
Provincial Officer
London District Office

cc. Middlesex London Health Unit
Upper Thames River Conservation Area
London District File



Ministry of the Environment, Conservation and Parks

CITY OF LONDON DISTRIBUTION SYSTEM

Inspection Report

Site Number:	260004917
Inspection Number:	1-15JGA
Date of Inspection:	Dec 10, 2018
Inspected By:	Neville Rising

Table of Contents

Owner Information.....	2
Inspection Details.....	2
Inspection Summary.....	9
LMR – Introduction.....	9
LMR – Treatment Processes	9
LMR – Treatment Process Monitoring	10
LMR – Distribution System.....	11
LMR – Operations Manuals	11
LMR – Logbooks	12
LMR – Security.....	12
LMR – Certification and Training	12
LMR – Water Quality Monitoring.....	13
LMR – Water Quality Assessment.....	15
LMR – Reporting and Corrective Actions.....	15
LMR – Other Inspection Findings	15
Non Compliance with Regulatory Requirements and Actions Required.....	17
Summary of Recommendations and Best Practice Issues.....	18
Signatures	19

Appendix A: Stakeholder References

Appendix B: Inspection Rating Record and Inspection Risk Methodology

OWNER INFORMATION:

Company Name:	LONDON, THE CORPORATION OF THE CITY OF	Unit Identifier:	
Street Number:	300		
Street Name:	DUFFERIN Ave		
City:	LONDON		
Province:	ON	Postal Code:	N6A 4L9

CONTACT INFORMATION
INSPECTION DETAILS:

Site Name:	CITY OF LONDON DISTRIBUTION SYSTEM
Site Address:	300 Dufferin Avenue LONDON ON N6A 4L9
County/District:	London
MECP District/Area Office:	London District
Health Unit:	MIDDLESEX-LONDON HEALTH UNIT
Conservation Authority:	
MNR Office:	
Category:	Large Municipal Residential
Site Number:	260004917
Inspection Type:	Announced
Inspection Number:	1-15JGA
Date of Inspection:	Dec 10, 2018
Date of Previous Inspection:	Nov 29, 2017

COMPONENTS DESCRIPTION

Site (Name):	London Water Distribution System	Sub Type:	Other
Type:	Other		

Comments:
As of 2017, the Water Distribution System for London consisted of approximately 1,601 km of pipe ranging from 50 mm to 1050 mm. The type of pipe is roughly 42% polyvinyl chloride (PVC), 26% cast iron, 21% ductile iron, 8% reinforced concrete pressure pipe, and 3% steel. Water is obtained from the Elgin Area Primary Water Supply System as well as the Lake Huron Primary Water Supply System, serving approximately 385,000 people.

Site (Name):	John Gillies (Arva) Pumping Station	Sub Type:	Booster Station
Type:	Other		

Comments:
Location: 13966 Medway Road, R.R. 1, Arva ON

UTM Coordinates: NAD 83, Zone 17, Easting 4744384.92 m and Northing 4766239.87 m

Equipment: Three (3) fixed speed horizontal centrifugal pumps rated at 58,000 m³/d, 55 m TDH; One (1) fixed speed horizontal centrifugal pump rated at 55,000 m³/d, 33 m TDH; One (1) fixed speed horizontal centrifugal pump rated at 51,000 m³/d, 40 m TDH, One (1) fixed speed horizontal centrifugal pump rated at 140,000 m³/d, 37 m TDH

Fluoridation: Two (2) hydrofluorosilicic acid solution storage tanks, each 12.2 m³, two (2) day tanks, each 0.7 m³, online analyzer

Standby Power: 48 kW stationary diesel generator set

This main city pumping station conveys water to the City of London from the Lake Huron Primary Water Supply System reservoir in Arva. The pumping station is located adjacent to the Arva Reservoir. Pump discharge ball valves are used to modulate the discharge pressure. There are two parallel east and west pumping systems, with pumps 1, 2 and 3 on the west header, and pumps 4, 5 and 6 on the east header. Each discharge header has a magnetic flowmeter. A chlorine residual analyzer draws from the two headers. No chlorine is added at this location, but the distribution system is monitored on a continuous basis.

Fluoride is injected as 25% Hydrofluorosilicic Acid solution into the pump suction conduit. There is a flow-paced fluoride injection system which maintains the fluoride concentration at a consistent level. Fluoride concentration is monitored: continuously by an on-line analyzer, daily by bench test and weight consumed calculation, and weekly lab samples.

Site (Name): Elgin-Middlesex Pumping Station (London Portion)
Type: Other **Sub Type:** Booster Station
Comments:
Location: 490 South Edgeware Street, St. Thomas ON

UTM Coordinates: NAD 83, Zone 17, Easting 488296.00 m and Northing 4737955.00 m

Equipment: One (1) fixed speed horizontal centrifugal pump rated at 73,000 m³/d, 77.5 m TDH; Two (2) fixed speed horizontal centrifugal pumps rated at 45,000 m³/d, 46 m TDH

Surge Protection: One (1) 167 m³ hydro-pneumatic tank, with two (2) air compressors

Standby Power: None

Notes: A standby generator exists at this facility, but it is owned by the St. Thomas Secondary Water Supply System and the Aylmer Secondary Water Supply System. It is not part of the City of London Distribution System.

There is a dual-celled reservoir at this location that is shared amongst the City of St. Thomas, the Town of Aylmer and the City of London/County of Elgin - Middlesex, each cell with 27,300 m³ capacities.

Site (Name): Springbank Pumping Station
Type: Other **Sub Type:** Booster Station
Comments:
Location: 848 Commissioners Road W, London, ON

UTM Coordinates: NAD 83, Zone 17, Easting 474731.50 m and Northing 4755576.72 m

Equipment: Two (2) fixed speed vertical turbine pumps rated at 11,768 m³/d, 35.1 m TDH; Two (2) variable speed vertical turbine pumps rated at 12,355 m³/d, 50.8 m TDH

Rechlorination: Sodium hypochlorite solution storage tank, 118.6 L, two (2) chemical metering pumps, one (1) operating on standby, rated at 3.6 L/h, with automatic switchover between pumps, online-chlorine analyzer

Standby Power: 450 kW stationary diesel generator set

The Springbank Pumping Station and Reservoir #3 are located adjacent to each other on the south side of Commissioners Road. Springbank Reservoir #1 and #2 are located to the north of the Springbank Pumping Station and Reservoir #3.

Site (Name): Westmount Pumping Station
Type: Other **Sub Type:** Booster Station

Comments:
Location: 603 Wonderland Road S, London, ON

UTM Coordinates: NAD 83, Zone 17, Easting 476275.11 m and Northing 4755700.82 m

Equipment: Four (4) variable speed vertical turbine pumps rated at 15,725 m³/d, 30 m TDH

Standby Power: 250 kW stationary diesel generator set

Site (Name): Pond Mills Pumping Station
Type: Other **Sub Type:** Booster Station

Comments:
Location: 1121 Commissioners Rd E, London, ON

UTM Coordinates: NAD 83, Zone 17, Easting 483865.44 m and Northing 4756577.00 m

Equipment: One (1) variable speed vertical turbine pump rated at 6,497 m³/d, 33.5 m TDH; Two (2) variable speed vertical turbine pumps rated at 10,454 m³/d, 33.5 m TDH

Standby Power: 200 kW stationary diesel generator set

Site (Name): Wickerson Pumping Station
Type: Other **Sub Type:** Booster Station

Comments:
Location: 2080 Wickerson Rd, London, ON

UTM Coordinates: NAD 83, Zone 17, Easting 471443.06 m and Northing 4755230.30 m

Equipment: Two (2) variable speed vertical turbine pumps rated at 11,578 m³/d, 38 m TDH; One (1) variable speed vertical turbine pump rated at 2,851 m³/d, 34 m TDH

Standby Power: 130 kW stationary diesel generator set

Site (Name): Hyde Park Pumping Station
Type: Other **Sub Type:** Booster Station

Comments:
Location: 1617 Hyde Park Rd, London, ON

UTM Coordinates: NAD 83, Zone 17, Easting 472944.70 m and Northing 4760841.25 m

Equipment: Two (2) variable speed vertical turbine pumps rated at 17,971 m³/d, 18.2 m TDH; One (1) variable speed vertical turbine pump rated at 8,208 m³/d, 14.0 m TDH

Standby Power: 230 kW stationary diesel generator set

Site (Name): Uplands Pumping Station
Type: Other **Sub Type:** Booster Station
Comments:
Location: 221 Sunningdale Rd E, London, ON

UTM Coordinates: NAD 83, Zone 17, Easting 477102.10 m and Northing 4765327.98 m

Equipment: Three (3) variable speed vertical turbine pumps rated at 9,072 m³/d, 18.4 m TDH; One (1) variable speed vertical turbine pump rated at 3,197 m³/d, 10.7 m TDH

Standby Power: 160 kW stationary diesel generator set

Site (Name): Springbank Reservoir #1
Type: Other **Sub Type:** Reservoir
Comments:
Location: 869 Commissioners Rd W, London ON

UTM Coordinates: NAD 83, Zone 17, Easting 474794.57 m and Northing 4755801.67 m

Description: In-ground reservoir

Dimensions: 117 m by 97 m, 11 m depth

Capacity: 81,800 m³ capacity

Notes: Rechlorination provided on-site and at Springbank Meterhouse No. 4

Site (Name): Springbank Reservoir #2
Type: Other **Sub Type:** Reservoir
Comments:
Location: 869 Commissioners Rd W, London ON

UTM Coordinates: NAD 83, Zone 17, Easting 474794.57 m and Northing 4755801.67 m

Description: In-ground reservoir

Dimensions: 105 m by 75.9 m at the top, 76 m by 44.2 m at the bottom, 9.23 m depth

Capacity: 45,400 m³ capacity

Notes: Reservoir has sloped sides and is equipped with a floating cover. Rechlorination provided on-site and at Springbank Meterhouse No. 4

Site (Name): Springbank Reservoir #3
Type: Other **Sub Type:** Reservoir
Comments:

Location: 848 Commissioners Rd W, London ON

UTM Coordinates: NAD 83, Zone 17, Easting 474731.50 m and Northing 4755576.72 m

Description: In-ground reservoir

Dimensions: 117 m by 97 m, 11 m depth

Dimensions: 81,800 m3 capacity

Notes: Connected to the Springbank Pumping Station, Rechlorination provided at Springbank Pumping Station and at Springbank Meterhouse No. 4

Site (Name): Elgin-Middlesex Terminal Reservoir - London Cell
Type: Other **Sub Type:** Reservoir
Comments:

Location: 490 South Edgeware St, St. Thomas ON

UTM Coordinates: NAD 83, Zone 17, Easting 488296.00 m and Northing 4737955.00 m

Description: One cell of an in-ground reservoir comprised of two (2) baffled cells in total

Dimensions : 71.7 m x 64.6 m, 5.9 m deep

Capacity: 27,300 m3 capacity

Notes: Treated water is supplied to this reservoir by the Elgin Area Primary Water Supply System. The Elgin-Middlesex Pumping Station (London Portion) draws water from this reservoir and pumps into the London Distribution System.

Site (Name): Elgin-Middlesex Pumping Station Hydro-Pneumatic Surge Tank
Type: Other **Sub Type:** Other
Comments:

Location: 490 South Edgeware St, St. Thomas ON

UTM Coordinates: NAD 83, Zone 17, Easting 488296.00 m and Northing 4737955.00 m

Description: Steel pressure vessel

Dimensions: 167 m3 nominal capacity

Notes: Equipped with two (2) positive displacement air compressors rated at 7.4 m3/min at 1,380 kPa

Site (Name): Springbank Meterhouse No. 4 Rechlorination System
Type: Other **Sub Type:** Secondary Treatment

Comments:
Location: 809 Commissioners Rd W, London ON

UTM Coordinates: NAD 83, Zone 17, Easting 474932.59 m and Northing 4755630.50 m

Equipment: Two (2) booster pumps, one (1) duty and one (1) standby, gas chlorinator rated at 24 kg/d, two (2) chlorine cylinders on electronic scales, one (1) chlorine leak detector, one (1) portable standby chlorinator connection

Notes: Chlorine gas system. Compound loop control re-chlorination system with an on-line chlorine analyzer

Site (Name): Springbank Reservoirs No.1 & 2 - Rechlorination System
Type: Other **Sub Type:** Secondary Treatment

Comments:
Location: 869 Commissioners Rd W, London ON

UTM Coordinates: NAD 83, Zone 17, Easting 474794.57 m and Northing 4755801.67 m

Equipment: Two (2) booster pumps, one (1) for the injector and one (1) for the analyser, gas chlorinator rated at 24 kg/d, two (2) chlorine cylinders on electronic scales, one (1) chlorine leak detector, one (1) portable standby chlorinator connection

Notes: Chlorine gas system. Compound loop control re-chlorination system with an on-line chlorine analyzer

Site (Name): Springbank Pumping Station Rechlorination System
Type: Other **Sub Type:** Secondary Treatment

Comments:
Location: 848 Commissioners Rd W, London ON

UTM Coordinates: NAD 83, Zone 17, Easting 474731.50 m and Northing 4755576.72 m

Equipment: Two (2) Sodium Hydroxide metering pumps, one (1) duty, one (1) standby, rated at 3.6 L/h, one (1) Sodium Hydroxide plastic storage tank having 118.6 L capacity

Notes: 12% Sodium Hydroxide system. PID control re-chlorination system with an on-line chlorine analyzer

Site (Name): Southeast Reservoir and Pumping Station
Type: Other **Sub Type:** Reservoir

Comments:
Approval was granted to construct a 113 ML reservoir and pumping station to primarily service the southeast area of the City of London. It will consist of the following major components:
- an in-ground reservoir consisting of two (2) baffled cells each approximately 57 ML in volume complete with all necessary inlet, outlet and inter cell piping and valving as per the contract drawings.
- four (4) horizontal-split case water pumps each rated at 434 L/s at 62 m Total Dynamic Head (TDH) complete with all necessary piping, valves and controls as per the contract drawings.

-
- two (2) pumps, each rated at 125 L/s at a TDH of 58 m and equipped with adjustable speed drives;
 - a gas chlorination system consisting of two (2) nominal 70 kg gas chlorine cylinders stored within two (2) containment vessels in a separate chlorination room for the purpose of re-chlorinating water as it enters the reservoir system and/or on the pumping station discharge, on an as-needed basis, and three (3) wall mounted gas chlorinators, each rated at 45 kg/d; one (1) for re-chlorination of the common reservoir inlet pipe and one (1) for each of the two (2) pumping station discharge pipes. System complete with chlorine analyzers, scales, chlorine gas detection equipment and controls for flow pacing and/or compound loop control.
 - a 1,250 kW diesel generator set complete with fuel tank, electrical, and controls.
 - all additional mechanical, structural, architectural, and electrical components designed for the facility to be constructed as per the contract drawings.
-

Site (Name): MOE DWS Mapping
Type: DWS Mapping Point

Sub Type:

INSPECTION SUMMARY:

Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period.**

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg.170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This report is based on an inspection of a "stand alone connected distribution system". This type of system receives treated water from a separately owned "donor" system. This report contains the elements required to assess key compliance and conformance issues associated with a "receiver" system. This report does not contain items associated with the inspection of the donor system, such as source waters, intakes/wells and treatment facilities.

This report is based on a "focused" inspection of the system. Although the inspection involved fewer activities than those normally undertaken in a detailed inspection, it contained critical elements required to assess key compliance issues. This system was chosen for a focused inspection because the system's performance met the ministry's criteria, most importantly that there were no deficiencies as identified in O.Reg. 172/03 over the past 3 years. The undertaking of a focused inspection at this drinking water system does not ensure that a similar type of inspection will be conducted at any point in the future.

This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

As part of the inspection, several documents were reviewed to support the conclusions and inferences presented within this report. Generally, these include but are not limited to:

1. Drinking Water Works Permit # 006-201, Issue #4 dated September 21, 2017
2. Municipal Drinking Water Licence # 006-101, Issue #5 dated September 21, 2017
3. "Waterworks Operations and Maintenance Manual" prepared by the City of London and dated March 2018.

Other documents reviewed include microbiological and chemical testing results, logsheets, etc. It should be noted that this inspection covers the period from November 1, 2017 to November 30, 2018.

The City of London water distribution system receives treated water from the Lake Huron Primary Water Supply System (WW# 210000791) and the Elgin Area Primary Water Supply System (WW# 210000871).

Treatment Processes

- **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

At the time of the site inspection, the Fanshawe and Hyde Park well fields and treatment systems were physically disconnected from the City of London drinking water system. In addition, the Southeast Reservoir and Pumping Station became operational on September 11, 2017. The aforementioned changes to the system are not referenced in the current Drinking Water Works Permit #006-201 - Issue #4, dated September 21, 2017, however, the Owner / Operating Authority did complete the appropriate Director's Notification Forms and Form 2 documents to account

Treatment Processes

for the changes. It is inferred these changes will be present in the next issued Drinking Water Works Permit.

- **The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

Over the course of the inspection period, the Operating Authority provided a total of 27 Form 1 documents for review associated with the installation of new watermains and the replacement / extension of existing watermains.

- **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

Over the course of the inspection period, the Operating Authority provided one Form 2 document for review associated with modifications to the impeller on High Lift Pump #6 at the Arva Pumping Station. A Director's Notification form was also completed in association with the modification to this pump.

- **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

The City of London Distribution System is equipped with permanent rechlorination systems and multiple online free chlorine analyzers throughout the distribution system through which the free chlorine is continually monitored. In addition, the Operating Authority also uses portable chlorine analyzers to measure the concentration of free chlorine at various locations throughout the distribution system when collecting microbiological samples.

According to the manual grab samples collected, there were no events when the concentration of free chlorine was less than 0.05 mg/L. In addition, according to the alarm summaries associated with the online free chlorine analyzers, there were no occasions when the concentration of free chlorine was less than 0.05 mg/L with the exception of short, acceptable periods of time during which power outages, equipment calibrations, etc., occurred.

Treatment Process Monitoring

- **The secondary disinfectant residual was measured as required for the distribution system.**

Ontario Regulation 170/03 – Schedule 7-2(3) and 7-2(4) stipulates that at least seven distribution samples are collected for testing each week for free chlorine residual. A sample for chlorine residual testing can be collected each day, otherwise at least four samples must be collected on one day, and at least three samples must be collected on another day in the same week, at least 48 hours apart.

The City of London uses a portable meter to collect free chlorine residual readings throughout the distribution system in conjunction with the collection of microbiological samples. Based on the sampling regime, the City of London collects at least four samples on one day in a week, and at least three samples on another day in the same week, separated by at least 48 hours.

In addition, there are several locations throughout the distribution system where online free chlorine meters are utilized for operational purposes. These online analyzers are fitted with alarms to notify the Operating Authority in the event that the free chlorine concentrations are less than the alarm setpoints. They are not considered regulatory meters.

- **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

The Operating Authority typically reviews the online data on a daily basis by way of the SCADA system.

- **All continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or**

Treatment Process Monitoring

shut-off mechanisms that satisfy the standards described in Schedule 6.

The City of London Distribution system is equipped with online operational chlorine analysers at each of its major components. At these locations, the concentration of free chlorine is continuously monitored and recorded. Although the Operating Authority does not rely on these online meters to meet with the regulatory requirements for free chlorine monitoring, they have been set up with alarms to aid with the operation of the system. Generally stated, the current free chlorine alarms setpoints are as follows:

1. Low Low Alarm = 0.20 mg/L
2. Low Alarm = 0.25 to 0.30 mg/L
3. High Alarm = 1.5 mg/L (Shut Down)
4. High High Alarm = 2.0 mg/L

There are two operational online fluoride analyzers located at the Arva Reservoir and the Southeast Reservoir and Pumping Station. The alarm setpoints for these meters are as follows:

1. Low Low Alarm = 0.40 mg/L
2. Low Alarm = 0.50 mg/L
3. High Alarm = 0.80 mg/L
4. High High Alarm = 1.00 mg/L (Shut Down at 0.90 mg/L)

In addition, the Operating Authority also uses a portable chlorine analyzer to measure the concentration of free chlorine at various locations throughout the distribution system.

- **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

The City of London utilizes several online free chlorine analyzers throughout the distribution system at major components for operational purposes. In addition, there are two online fluoride analyzers used to measure the fluoride concentrations from the Arva Reservoir and from the Southeast Reservoir and Pumping Station. As part of the City of London maintenance and calibration procedures, their portable meters are verified on a quarterly basis and these portable meters are used to assess the accuracy of the operational (non-regulatory) online meters throughout the system. In the event that the measurements from the online analyzers relative to the portable meters exceeds an acceptable range, adjustments are made to ensure their accuracy. The Operating Authority advised that records of all adjustments are maintained on logsheets.

Distribution System

- **Existing parts of the distribution system that are taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that come in contact with drinking water, were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit, or an equivalent procedure (i.e. the Watermain Disinfection Procedure).**

The Operating Authority provided some representative documents as related to the installation of new watermains and the maintenance of watermains. The provided documents met with the requirements of the current Watermain Disinfection Procedure. Further details are provided in the best management practices of this report.

Operations Manuals

- **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

Operations Manuals

- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**

Since the issuance of the previous annual inspection of the water system, the Owner / Operating Authority was required to prepare an up to date Operations and Maintenance Manual to account for certain changes including but not limited to the decommissioning of the back up well system, and the commissioning of the new South East Reservoir Pumping Station. The required modifications to the Operations and Maintenance Manual were required to be completed by March 31, 2018. On March 28, 2018, the Owner / Operating Authority provided an updated Operations and Maintenance Manual which meets with the requirements prescribed by Section 16.3 of Municipal Drinking Water Licence #006-101 - Issue #5.

Logbooks

- **Logbooks were properly maintained and contained the required information.**

The Operating Authority maintains logsheets at each of the components of the system in which daily entries are made as related to the operations of the system, while logbooks are used to record unusual activities. The identification of the Operator making entries to the logsheets and logbooks is noted. In addition, digital logs are maintained of any alarm or unusual activity noted with the review of the online data from the continuous free chlorine analyzers.

- **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

The City of London employs Certified Operators to conduct any tests not completed by online continuous monitoring equipment.

Security

- **The owner had not provided security measures to protect components of the drinking water system.**

The component buildings associated with the City of London water distribution system remain locked at all times and are equipped with entry alarms which are connected to a dialing system to alert the Operating Authority / Owner of unauthorised entry.

As part of the previous annual inspection of the water system, it was recommended that the Owner / Operating Authority retrofit the hatch seals associated with Springbank Reservoir #3 and the Southeast Reservoir Pumping Station to ensure they are functioning properly. At the time of the inspection, all of the hatches associated with the Southeast Reservoir Pumping Station were fitted with new seals, and the Operating Authority installed two new hatches with seals and screens at Springbank Reservoir #3.

At the time of the site inspection, there was evidence of insect nests within the three vents associated with Springbank Reservoir #1 and #2. Closer examination revealed that the screen grates over the vents were a large sized mesh / aperture exceeding the recommended #24 mesh size as prescribed by the Ten States Standards (2012 Edition).

Certification and Training

- **The overall responsible operator had been designated for each subsystem.**

The City of London currently has two qualified Operators that have been designated as the Overall Responsible Operators for the water systems. Each of these Operators rotate their duty as the ORO on a monthly basis. This combination of staff members provides continuity in the event of absenteeism.

Certification and Training

- **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**
- **Only certified operators made adjustments to the treatment equipment.**

Water Quality Monitoring

- **All microbiological water quality monitoring requirements for distribution samples were being met.**

Ontario Regulation 170/03 – Schedule 10-2 stipulates that distribution water samples are required to be collected for testing every week within the frequency prescribed by Ontario Regulation 170/03 – Schedule 6-1.1 (1). Testing of the samples collected from the distribution system must include E. coli, total coliforms on all samples, and 25% of the required samples must be tested for general bacteria population expressed as colony counts on a heterotrophic plate count.

According to the Operating Authority, the City of London Distribution system serves a total population of approximately 385000 people. Given this information, a minimum of 138 microbiological samples are required to be collected for testing each month. Over the course of the inspection period, the Operating Authority typically collected over 200 microbiological samples per month for testing which meets with the requirements of Ontario Regulation 170/03 – Schedule 10-2.

- **All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.**

Ontario Regulation 170/03 – Schedule 13-6.1 stipulates that haloacetic acids are required to be collected and tested every three months from the distribution water within the required frequency as prescribed by Ontario Regulation 170/03 – Schedule 6-1.1(4). According to documentation provided for review from the Owner / Operating Authority, samples were collected on the following days from the distribution system:

1. December 13, 2017 – HAA = 18.1 ug/L, 8.6 ug/L, 5.3 ug/L, 5.3 ug/L
2. January 16, 2018 – HAA = 5.3 ug/L
3. March 15, 2018 – HAA = 22.3 ug/L, 23.9 ug/L, 19.4 ug/L, 17.3 ug/L
4. April 5, 2018 – HAA = 6.8 ug/L
5. June 27, 2018 – HAA = 18.8 ug/L, 22.3 ug/L, 14.0 ug/L, 6.2 ug/L
6. July 24, 2018 – HAA = 17.9 ug/L
7. September 17, 2018 – HAA = 6.1 ug/L, 25.3 ug/L
8. September 18, 2018 – HAA = 13.2 ug/L, 28.7 ug/L
9. September 19, 2018 – HAA = 11.4 ug/L, 12.2 ug/L, 11.4 ug/L
10. October 16, 2018 – HAA = 9.5 ug/L

Based on the aforementioned tests, the Owner / Operating Authority are in compliance with the requirements for collecting haloacetic acids water quality samples as prescribed on Ontario Regulation 170/03 – Schedule 13-6.1.

- **All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.**

Ontario Regulation 170/03 – Schedule 13-6 stipulates that trihalomethanes are required to be collected and tested every three months from the distribution water within the required frequency as prescribed by Ontario Regulation 170/03 – Schedule 6-1.1(4). According to documentation provided for review from the Owner / Operating Authority, samples were collected from the distribution system on the following dates:

Water Quality Monitoring

1. December 13, 2017 – THM = 32 ug/L, 26 ug/L, 20 ug/L, 17 ug/L
2. January 16, 2018 – THM = 12 ug/L
3. March 15, 2018 – THM = 24 ug/L, 27 ug/L, 25 ug/L, 20 ug/L
4. April 5, 2018 – THM = 13 ug/L
5. June 27, 2018 – THM = 30 ug/L, 35 ug/L, 25 ug/L, 19 ug/L
6. July 24, 2018 – THM = 26 ug/L
7. September 17, 2018 – THM = 23 ug/L, 43 ug/L
8. September 18, 2018 – THM = 29 ug/L, 51 ug/L
9. October 16, 2018 – THM = 26 ug/L

Based on the aforementioned tests, the Owner / Operating Authority are in compliance with the requirements for collecting trihalomethane water quality samples as prescribed by Ontario Regulation 170/03 – Schedule 13-6.

- **All water quality monitoring requirements imposed by the Municipal Drinking Water Licence and Drinking Water Works Permit were being met.**

Schedule C - Section 5 of the Municipal Drinking Water Licence #006-101 (Issue #5 dated 21 Sept 2017) stipulates that a study is required to assess the effectiveness of the corrosion control plan implemented by the City of London. Generally stated, the study involves the collection and analysis of lead, alkalinity, pH, etc., samples from the distribution system and residential and non-residential sampling locations. Section 5.3 stipulates that a Corrosion Control Evaluation Report be prepared and submitted to the Director by March 31, annually. In addition, Section 5.4 of stipulates that the sampling data outlined in Section 5.1.3 be submitted to the Director by January 31, annually.

Specific testing requirements presented in the Schedule C, Table 1 include the following:

Point of Entry at SERPS and Arva Pumping Station:

- a. Lead Sampling – Quarterly
- b. Alkalinity – Monthly
- c. pH - Weekly

Distribution Samples:

- a. Lead, Alkalinity and pH – 5 samples annually (From Jan 1 to Dec 31)

Residential / Non-Residential Taps:

- a. Lead, Alkalinity and pH – 25 samples annually (From Jan 1 to Dec 31)

Over course of the inspection period (November 1, 2017 to November 30, 2018) the Operating Authority collected a significant proportion of the required samples for lead, alkalinity and pH samples as prescribed by Schedule C - Section 5 of the Municipal Drinking Water Licence #006-101. Generally stated, all of the required quarterly, monthly and weekly samples from the Point of Entries to the water system (i.e. SERPS and Arva Pumping Station) were being collected as required. In addition, samples from the distribution system and residential / non-residential taps were collected, however, additional samples beyond this inspection period (i.e. November 30, 2018) were still required at the time of preparing this report. It is understood that the Owner / Operating Authority is continuing their efforts with regards to lead sampling through the month of December 2018 to meet with the Section C requirements. As such, compliance will be assessed during the next annual inspection of the water system.

In addition, Schedule D – Section 2.0 of Municipal Drinking Water Licence #006-101 (Issue #5 dated 21 Sept 2017) stipulates certain relief conditions associated with the operation of the Fanshawe and Hyde Park Emergency Well

Water Quality Monitoring

System. However, in October 2017, the Fanshawe and Hyde Park well systems were physically disconnected from the City of London distribution system, and as such, this testing is no longer possible. A Director's Notification form was submitted with regard to these changes.

- **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

Water Quality Assessment

- **Records did not show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

Over the course of the inspection period, there were a total of 9 adverse water quality incidents ("AWQI"). Seven of the AWQIs were related to microbiological contamination based on testing performed by the laboratory. Two of the incidents were related to Lead Exceedances from plumbing samples in association with the testing requirements in the system's Corrosion Control Plan. It should be further noted that although there were only two reported Lead Exceedance Notifications, there were a total of six actual lead exceedance locations based on the reported samples.

Reporting & Corrective Actions

- **Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

Over the course of the inspection period, there were a total of seven adverse water quality incidents ("AWQI"). Each of these AWQIs were related to microbiological contamination based on testing performed by the laboratory. During these events, the appropriate corrective actions were completed and the Spills Action Centre and the Medical Officer of Health (i.e. Health Unit) were contacted.

- **Corrective actions as directed by the Medical Officer of Health had been taken by the owner and operating authority to address exceedances of the lead standard.**

Over the course of the inspection period, there were two lead exceedance notification ("LEN") forms completed by the Owner \ Operating Authority. These two LENs represented a total of six reported lead exceedances taken from the plumbing of residential homes connected to the drinking water system. As part of these incidents, the Owner / Operating Authority provided written correspondence to each of the building occupants, which included a copy of the analytical results, a letter explaining the results, information from the local Health Unit on lead, and contact numbers for further information.

- **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**
- **All changes to the system registration information were provided within ten (10) days of the change.**

Other Inspection Findings

- **The following instance(s) of non-compliance were also noted during the inspection:**

Ontario Regulation 170/03 – Schedule 15.1-9 (5) stipulates that the Owner / Operating Authority shall report any lead exceedances to the Medical Officer of Health within 24 hours of receiving the report from the testing laboratory. According to documentation provided by the Operating Authority, certain lead exceedances for samples

Other Inspection Findings

collected in December 2017, and associated with Lead Exceedance Notification # 138449, were not reported by the Owner / Operating Authority to the Medical Officer within 24 hours as prescribed by Ontario Regulation 170/03 – Schedule 15.1-9 (5). The Operating Authority recognized this issue after the 24 hour period expired.

- **The following issues were also noted during the inspection:**

The forms associated with the installation of new watermains at the drinking water system include several fields that are pertinent to satisfying the requirements of the "Watermain Disinfection Procedure, November 2015". Additional, pertinent information not included on these forms, is presented within logsheets provided by the Operating Authority. It is understood that the current 2015 Watermain Disinfection Procedure document is being reviewed for possible modifications.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

1. The following instance(s) of non-compliance were also noted during the inspection:

Ontario Regulation 170/03 – Schedule 15.1-9 (5) stipulates that the Owner / Operating Authority shall report any lead exceedances to the Medical Officer of Health within 24 hours of receiving the report from the testing laboratory. According to documentation provided by the Operating Authority, certain lead exceedances for samples collected in December 2017, and associated with Lead Exceedance Notification # 138449, were not reported by the Owner / Operating Authority to the Medical Officer within 24 hours as prescribed by Ontario Regulation 170/03 – Schedule 15.1-9 (5). The Operating Authority recognized this issue after the 24 hour period expired.

Action(s) Required:

From herein, the Owner / Operating Authority shall ensure that all lead exceedances associated with plumbing samples are reported to the Medical Officer within 24 hours after the receipt of the results from the testing laboratory as prescribed by Ontario Regulation 170/03 – Schedule 15.1-9 (5).

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

1. The owner had not provided security measures to protect components of the drinking water system.

The component buildings associated with the City of London water distribution system remain locked at all times and are equipped with entry alarms which are connected to a dialing system to alert the Operating Authority / Owner of unathourized entry.

As part of the previous annual inspection of the water system, it was recommended that the Owner / Operating Authority retrofit the hatch seals associated with Springbank Reservoir #3 and the Southeast Reservoir Pumping Station to ensure they are functioning properly. At the time of the inspection, all of the hatches associated with the Southeast Reservoir Pumping Station were fitted with new seals, and the Operating Authority installed two new hatches with seals and screens at Springbank Reservoir #3.

At the time of the site inspection, there was evidence of insect nests within the three vents associated with Springbank Reservoir #1 and #2. Closer examination revealed that the screen grates over the vents were a large sized mesh / aperture exceeding the recommended #24 mesh size as prescribed by the Ten States Standards (2012 Edition).

Recommendation:

It is recommended that the Owner / Operating Authority modify the current vent screens associated with Springbank Reservoir #1 and #2 to conform with the Ten States Standards (2012 Edition) and ensure the size of the vent screen are at least #24 mesh and composed of a non-corrodible material.

2. The following issues were also noted during the inspection:

The forms associated with the installation of new watermains at the drinking water system include several fields that are pertinent to satisfying the requirements of the "Watermain Disinfection Procedure, November 2015". Additional, pertinent information not included on these forms, is presented within logsheets provided by the Operating Authority. It is understood that the current 2015 Watermain Disinfection Procedure document is being reviewed for possible modifications.

Recommendation:

It is recommended that the Owner / Operating Authority review their documentation as associated with the installation of new watermains and consolidate this information into a form that includes all of the pertinent requirements as presented in the "Watermain Disinfection Procedure, November 2015". In addition, in the event of any forthcoming modifications to the "Watermain Disinfection Procedure, November 2015", it is recommended that the forms be re-visited by the Owner / Operating Authority to ensure any required modifications are completed.

SIGNATURES

Inspected By:

Neville Rising

Signature: (Provincial Officer)



Reviewed & Approved By:

Mark Smith

Signature: (Supervisor)

Mark
SmithDigitally signed by Mark
Smith
DN: cn=Mark Smith, o=ou,
email=mark.smith@ontario.
ca, c=CA
Date: 2019.01.09 11:56:24
-0500

Review & Approval Date:

January 9, 2019

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

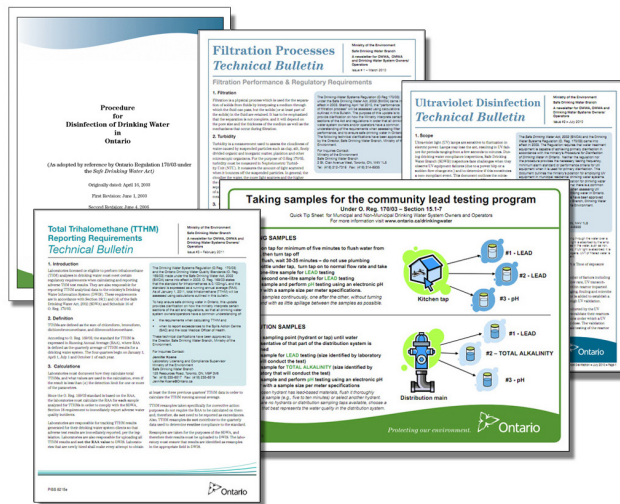
Stakeholder References

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or picemail.moe@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater and email drinking.water@ontario.ca to subscribe to drinking water news.



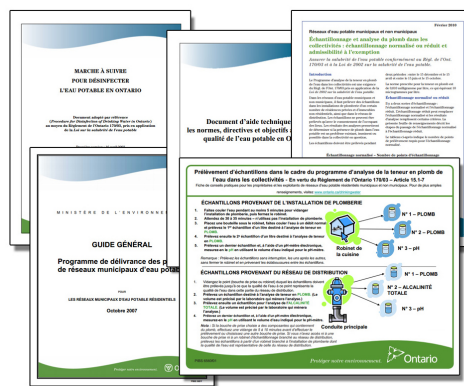
PUBLICATION TITLE	PUBLICATION NUMBER
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	7889e01
FORMS: Drinking Water System Profile Information, Laboratory Services Notification, Adverse Test Result Notification Form	7419e, 5387e, 4444e
Procedure for Disinfection of Drinking Water in Ontario	4448e01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	7152e
Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)	8215e
Filtration Processes Technical Bulletin	7467
Ultraviolet Disinfection Technical Bulletin	7685
Guide for Applying for Drinking Water Works Permit Amendments, Licence Amendments, Licence Renewals and New System Applications	7014e01
Certification Guide for Operators and Water Quality Analysts	
Guide to Drinking Water Operator Training Requirements	9802e
Taking Samples for the Community Lead Testing Program	6560e01
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	7423e
Guide: Requesting Regulatory Relief from Lead Sampling Requirements	6610
Drinking Water System Contact List	7128e
Technical Support Document for Ontario Drinking Water Quality Standards	4449e01

ontario.ca/drinkingwater

Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment.

Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le Centre d'information au public au 1 800 565-4923 ou au 416 325-4000, ou encore à picemail.moe@ontario.ca si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site www.ontario.ca/eaupotable ou envoyez un courriel à drinking.water@ontario.ca pour suivre l'information sur l'eau potable.

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Prendre soin de votre eau potable – Un guide destiné aux membres des conseils municipaux	7889f01
Renseignements sur le profil du réseau d'eau potable, Avis de demande de services de laboratoire, Formulaire de communication de résultats d'analyse insatisfaisants et du règlement des problèmes	7419f, 5387f, 4444f
Marche à suivre pour désinfecter l'eau potable en Ontario	4448f01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)	7152e
Total Trihalomethane (TTHM) Reporting Requirements: Technical Bulletin (février 2011) (en anglais seulement)	8215e
Filtration Processes Technical Bulletin (en anglais seulement)	7467
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	7685
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable, de modification du permis de réseau municipal d'eau potable, de renouvellement du permis de réseau municipal d'eau potable et de permis pour un nouveau réseau	7014f01
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802f
Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités	6560f01
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	7423f
Guide: Requesting Regulatory Relief from Lead Sampling Requirements (en anglais seulement)	6610
Liste des personnes-ressources du réseau d'eau potable	7128f
Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario	4449f01

ontario.ca/eaupotable

Inspection Rating Record and Inspection Risk Methodology

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS



The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal

year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

ontario.ca/drinkingwater

The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system’s operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry’s annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario’s Risk Management Framework. Risk management is a systematic approach to identifying potential hazards, understanding the likelihood and consequences of the hazards, and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:	
Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:	
Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 3:

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?

Risk = Likelihood × Consequence

C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	Major Administrative Consequence	Minor Environmental Consequence	Minor Health Consequence	Medium Environmental Consequence	Major Environmental Consequence	Medium Health Consequence	Major Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
R=4	R=2	R=6	R=12	R=15	R=6	R=21	R=16

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions related to regulatory compliance and input their “yes”, “no” or “not applicable” responses into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone); type of inspection (i.e., focused, detailed); and source type (i.e., groundwater, surface water).

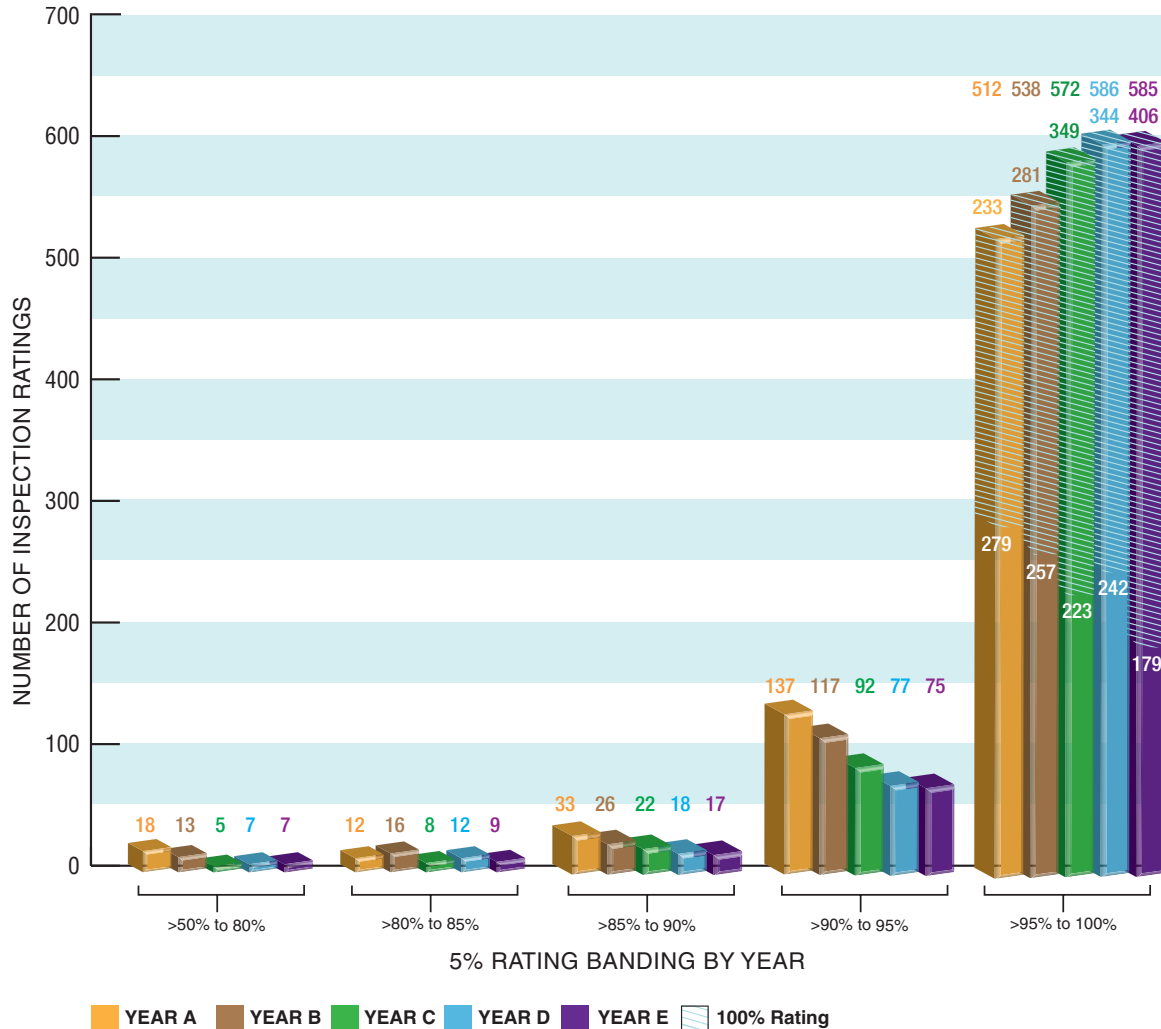
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol,

which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

- | | | | |
|-------------------------|------------------------|---------------------------------------|--|
| 1. Source | 5. Process Wastewater | 9. Contingency and Emergency Planning | 12. Water Quality Monitoring |
| 2. Permit to Take Water | 6. Distribution System | 10. Consumer Relations | 13. Reporting, Notification and Corrective Actions |
| 3. Capacity Assessment | 7. Operations Manuals | 11. Certification and Training | 14. Other Inspection Findings |
| 4. Treatment Processes | 8. Logbooks | | |

For further information, please visit www.ontario.ca/drinkingwater

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2018-2019)

DWS Name:	CITY OF LONDON DISTRIBUTION SYSTEM
DWS Number:	260004917
DWS Owner:	London, The Corporation Of The City Of
Municipal Location:	London

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Adhoc
Inspection Date: December 10, 2018
Ministry Office: London District

Maximum Question Rating: 334

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 43
Distribution System	0 / 21
Operations Manuals	0 / 28
Logbooks	0 / 18
Certification and Training	0 / 28
Water Quality Monitoring	0 / 63
Reporting & Corrective Actions	0 / 63
Other Inspection Findings	0 / 0
Treatment Process Monitoring	0 / 70
TOTAL	0 / 334

Inspection Risk Rating	0.00%
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FINAL INSPECTION RATING:	100.00%
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Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2018-2019)

DWS Name:	CITY OF LONDON DISTRIBUTION SYSTEM
DWS Number:	260004917
DWS Owner:	London, The Corporation Of The City Of
Municipal Location:	London
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Adhoc
Inspection Date:	December 10, 2018
Ministry Office:	London District

Non-compliant Question(s)	Question Rating
Other Inspection Findings	
In the event that an issue of non-compliance outside the scope of this inspection protocol is identified, a "No" response may be used if further actions are deemed necessary (and approved by the DW Supervisor) to facilitate compliance.	0
TOTAL QUESTION RATING	0

Maximum Question Rating: 334

Inspection Risk Rating	0.00%
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FINAL INSPECTION RATING:	100.00%
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(Access to Information Request A-2014-00168:
<http://www.fluoridefreepeel.ca/wp-content/uploads/2013/07/Health-Canada-FOI-Response-Letter-June2014.pdf>)

Dear Mayor and Councillors

I trust that you have done or are going to do your due diligence on the issue of artificial water fluoridation to make sure you are not given incorrect information. You will find that our MOH and many dentists will tell you that fluoridation is safe. What if they have just believed what they were told and did not do their due diligence?

However, hopefully you will do yours and not vote to put a toxic waste product, Hydrofluorosilicic acid in our drinking water without there being toxicology studies to show that it is safe for human consumption. As you can see by the projected pdf file, Health Canada also admits it has no toxicology studies on HFSA (and no double-blind randomized clinical trials of fluoridation, and thus no studies adequate to establish the alleged safety or efficacy of fluoridation); the Region, the province and the NSF are also unable to supply any such studies

Not only is this a very harmful process, it is against our individual rights granted to us in the Canada Charter of Rights and Freedoms. We are not to be medicated, (fluoridation is medication to prevent cavities) without informed consent, dose control, (the more water you drink, the more fluoride, which is cumulative, you get), and no regulation. No one can rebuke you for refusing to medicate your neighbours and dishonor their rights. Toothpaste, dental varnishes and gels are effective and regulated, with no waste. 97% or more of fluoridated water is wasted down the drain and into the environment.

I realize that this information is almost too much to really accept, given we are told it is safe for human consumption by our MOH and dentists who quite possibly have accepted what they were told and not done their own due diligence or their position requires they support the policy among other possible reasons for their miss-statements. Please do your own due diligences on this subject before you vote on it? You will find my presentation in your agenda with links to legitimate science
www.safewatermoncton.com www.fluoridealert.org
www.decisionduediligence.com

There is enough legitimate science in this book, "Pregnancy and Fluoride Do Not Mix" to end fluoridation today. There are legitimate studies under the auspices of the United States Institute of Health showing that when a pregnant woman drinks fluoridated water she is lowering the IQ of the baby she is carrying along with over 50 previous studies supporting this one. Despite the thousands of studies showing fluoride, a cumulative toxin, is harmful to humans, we really don't need them here in London to turn off the fluoridation tap tonight because, "**no toxicology studies, no fluoridation**". How do they know it is not harming us? How do they know it doesn't cause Alzheimer's when it is a well-proven neurotoxin.

Thank you in advance for voting for the well-being, increased IQ, and good health of yourself, your children and loved ones, as well as those who elected you, by voting to put artificial water fluoridation on hold using the Precautionary Principle, until it is proven safe for all citizens of London.

Thank you for listening.

Yesterday Water Fluoridation Received Three Major Body Blows

 fluoridealert.org/content/bulletin_1-10-19/

Yesterday Water Fluoridation received three major body blows. The first was political; the second was professional and the third was scientific.

1. The political body blow: Children’s Health Defense Calls for End to Fluoridation

Robert F. Kennedy Jr.’s nonprofit team published a must-read article yesterday condemning artificial water fluoridation as “A Forced Experiment That Needs to End.” While the Children’s Health Defense is primarily devoted to reducing exposure to mercury, part of its mission is to demand scientific integrity and expose public health policies that are harming children. Click below to read the article:



Here is a [link to the media release](#) that FAN put out today on this major development. Please forward this media release to your local media outlets.

2. Professional body blow: A popular dental blog questions the need for fluoride in dentistry.

While the American Dental Association and the American Fluoridation Society claim there is an absolute consensus amongst dentists that fluoride and fluoridation are “safe and effective,” we know this to be a myth. Hundreds of dentists have signed FAN’s professional statement calling for an end to fluoridation, and a week doesn’t go by without another dentist somewhere

publicly questioning the safety and benefits of the practice. In fact, I doubt the ADA has ever anonymously polled its own membership on their support for fluoridation out of fear of what might result.

This week, Dr. Mark Burhenne, DDS of Sunnyvale, California published a fairly comprehensive and well-researched article on his popular dental blog weighing the pros and cons of using both topical and non-topical fluoride, along with available alternatives.

In this major article, entitled “Ask the Dentist: Is Fluoride Safe?” he calls fluoride “a known toxin” that “most people don’t truly need...especially when its ingested via the water supply,” and concludes that “with safer alternatives available, it’s just not worth the risk.”

[READ DR. BURHENNE’S ARTICLE](#)

3. The Scientific body blow.

One of the world’s leading neuroscientists reviews the neurotoxicity of fluoride and sites the latest US government-funded [studies by Bashash et al, 2017 and 2018](#).

Dr. David Bellinger is one of the world’s leading neuroscientists. He is recognized as the leading authority on lead’s neurotoxicity. This week in the important journal *Pediatric Medicine* he published a review (***Environmental chemical exposures and neurodevelopmental impairments in children***) of the chemicals known to, or suspected, of damaging the child’s developing brain. He included fluoride in that list. In his introduction he wrote:

The central nervous system (CNS) is especially vulnerable to perturbation by environmental chemicals. Six of the 10 chemicals on the WHO’s list of chemicals of greatest public health concern adversely affect the brain (air pollution, arsenic, dioxin- and dioxin-like compounds, lead, mercury, and pesticides), with some evidence suggesting that two of the remaining four might do so as well (cadmium, **fluoride**). (our emphasis)

In the section devoted to fluoride he cites the Chinese IQ studies and the US government-funded studies by Bashash et al., 2017, 2018.

A review of nearly three dozen studies conducted in China, mostly ecologic in design and comparing children from a low-exposure village to a high-exposure village, concluded that exposure to water with greater fluoride concentrations is associated with lower IQ scores (66). Such studies provide only weak evidence, however, lacking data on internal exposures (i.e., blood concentrations of fluoride in individual participants or severity of dental fluorosis). Also the villages compared likely differed not only in water fluoride concentrations, but in also in terms of other factors that might affect the distributions of their IQ scores (e.g., socioeconomic status, access to medical care, quality of schools, etc.). Recently, studies that address these limitations have been reported. In a relatively small pilot study in China, negative associations were found between fluorosis severity, reflecting lifetime exposure, and children’s scores on some neuropsychological tests (67). Similar findings were reported in India (68), while in a Mexican study, children’s prenatal fluoride exposure (concentration in maternal urine

during pregnancy) were inversely associated with IQ scores at ages 4 and 6–12 years (69). Increased exposure to fluoride has also been linked, ecologically, to ADHD prevalence in the U.S. (70) and, in a cohort study, to increased ADHD symptoms in Mexican children (71).

66. Choi AL, Sun G, Zhang Y, et al. Developmental neurotoxicity of fluoride: a systematic review and meta-analysis. Environ Health Perspect 2012;120:1362-8.

67. Choi AL, Zhang Y, Sun G, et al. Association of lifetime exposure to fluoride and cognitive functions in Chinese children: a pilot study. Neurotoxicol Teratol 80. 2015;47:96-101.

68. Khan SA, Singh RK, Navit S, et al. Relationship between dental fluorosis and intelligence quotient of school going children in and around Lucknow district: a cross-sectional study. J Clin Diagn Res 2015;9:ZC10-5.

69. Bashash M, Thomas D, Hu H, et al. Prenatal fluoride exposure and cognitive outcomes in children at 4 and 6-12 years of age in Mexico. Environ Health Perspect 2017;125:097017. 82.

70. Malin AJ, Till C. Exposure to fluoridated water and attention deficit hyperactivity disorder (ADHD) prevalence among children and adolescents in the United States: an ecological association. Environ Health 2015;14:17.

71. Bashash M, Marchand M, Hu H, et al. Prenatal fluoride exposure and attention de cit hyperactivity disorder (ADHD. symptoms in children at 6-12 years of age in Mexico City. Environ Int 2018;121:658-66.

According to FAN’s director, Paul Connett, “What we have here is yet another leading neuroscientist acknowledging what government authorities and the media in countries which practice fluoridation are trying so hard to ignore or downplay, namely that fluoride – at doses experienced in fluoridated communities – has the potential to lower the intelligence of our children.”

Thank you,
Stuart Cooper
Campaign Director
Fluoride Action Network

See all FAN bulletins online

Support the Green Party of Canada's proposal to ban water fluoridation (forced to drink water with the neurotoxin Fluoride added).

<https://www.greenparty.ca/en/motion/g10-p19>

Preamble

WHEREAS fluoridation products such as hexafluorosilicic acid and sodium silicofluoride are toxic by-products scrubbed from the smokestacks of the phosphate mining industry, and less than one percent of treated water is actually ingested by people and the remaining 99 percent is discharged into the environment;

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 background levels of fluoride in the Great Lakes exceed the Canadian Water Quality Guideline (CWQG) for aquatic species, 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 & others;

WHEREAS the use of drinking water to deliver medications is not medically or environmentally sustainable, and the use of unregulated, unapproved medications in drinking water, without a prescription or informed consent is medically and environmentally not sustainable, and the daily dose of fluoride cannot be controlled and health effects from fluoride are not monitored;

WHEREAS 97 percent of Europe does not use artificial water fluoridation products in their public drinking water supply, and 94 percent of the world's population does not use artificial water fluoridation products in their public water supply;

WHEREAS no statistical difference exists in rates of dental caries between areas that use artificial water fluoridation chemicals and those that do not (Statistics Canada);

WHEREAS the Green Party affirms that the precautionary principle should be used where there is evidence of potential harm in the absence of complete scientific consensus.

Operative

BE IT RESOLVED that the Green Party seeks to introduce and support legislation that will ban artificial fluoridation products in public drinking water.

**The International Academy of
Oral Medicine and Toxicology (IAOMT)**
8297 ChampionsGate Blvd, #193
ChampionsGate, FL 33896
Phone (863) 420-6373; Website: www.iaomt.org



January 22, 2019

Dear Public Officials of the City of London, Ontario,

This letter is being sent to you establish that there is scientific evidence demonstrating the potential for harmful health effects caused by water fluoridation. Since you have been tasked with the responsibility of taking part in a decision about whether to fluoridate the water in your community, we urgently request that you take this opportunity to fairly and conscientiously evaluate the risks associated with fluoride use. We are aware that some dentists and health professionals will tout benefits of ingested fluoride; however, it is crucial that you also examine the most up-to-date body of facts relevant to hazardous impacts of fluoridation.

The International Academy of Oral Medicine and Toxicology (IAOMT) has been dedicated to its mission of protecting public health through the practice of biocompatible dentistry since it was founded in 1984. We are an organization of over 800 dentists, physicians, and research professionals in more than 14 countries, and the scientific activities of the IAOMT are overseen by a Scientific Advisory Board composed of leaders in Biochemistry, Toxicology, and Environmental Medicine. Our members have been expert witnesses about dental products and practices before the United Nations Environment Programme (UNEP), U.S. Congress, U.S. Food and Drug Administration (FDA), Health Canada, and other government bodies around the globe.

We recently reviewed hundreds of scientific studies and research articles and produced a detailed position paper against fluoridation that features over 500 citations supporting the potential for fluoride to cause adverse health outcomes. A summary of our official position is that **given the elevated number of fluoride sources and the increased rates of fluoride intake in the American population, which have risen substantially since water fluoridation began in the 1940's, it has become a necessity to reduce and work toward eliminating avoidable sources of fluoride exposure, including water fluoridation, fluoride-containing dental materials, and other fluoridated products.**

We implore you to read our full position paper, which can be found online at <https://iaomt.org/wp-content/uploads/IAOMT-Fluoride-Position-Paper.pdf>. Additional resources about fluoride from the IAOMT can also be located at <https://iaomt.org/resources/fluoride-facts/>. You might also be interested in the Fluoride Action Network (FAN)'s [Professionals Statement to End Water Fluoridation](#), which has been signed by over 4,000 medical, dental, scientific, and environmental professionals. Please feel free to contact us at info@iaomt.org or (863) 420-6373 if we can further assist you in understanding that fluoridation is an outdated, dangerous practice with the potential to harm your citizens and your community at large.

Sincerely,

A handwritten signature in black ink that reads 'David Kennedy DDS'.

David Kennedy, DDS, MIAOMT

A handwritten signature in black ink that reads 'John Kall DMD'.

John Kall, DMD, FAGD, MIAOMT

A handwritten signature in black ink that reads 'E. Griffin Cole'.

E. Griffin Cole, DDS, NMD, MIAOMT

Input to Feb. 05, 2019 CWC Meeting

Water Fluoridation – A Concern

Chris Gupta P. Eng

Deception

- Fluoridation schemes are dishonest and misleading as they don't inform the residents that the chemical to fluoridate their water is an industrial toxin such as Hydrofluorosilicic Acid (HFSA)*.
- Constituents think, and/or are led to believe, that the fluoride used will be pharmaceutical grade like what the dentists use. **It is illegal for dentists to use HFSA and to use in toothpastes.**
- Clearly no one in their right mind will knowingly vote to agree on adding traces of lead, arsenic, mercury etc. as found in HFSA to their municipal drinking water!
- The above violates Ontario's Safe Drinking Water Act of 2002, which states, Dilution is no defense for adding a contaminant to drinking water.

*Being a waste product, HFSA does not meet Good Manufacturing Practices (GMP).

Chris Gupta P. Eng

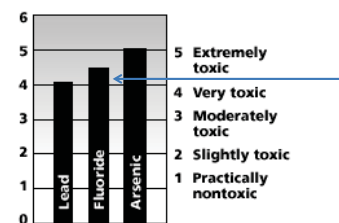
More Deception

- We are often told by Fluoridation Proponents that this industrial toxin disassociates into pharmaceutical grade fluoride once it is put in water as if traces of lead, arsenic, mercury etc. just disappear!
- This is like saying that road salt becomes pharmaceutical grade salt once mixed in cooking water!

Chris Gupta P. Eng

Fluoride is a known toxin

- In fact Fluoride is more toxic than lead.



- Based on LD50 data from Robert E. Gosselin et al, Clinical Toxicology of Commercial Products 5th ed., 1984. In fact Fluoride is more toxic than lead.

Chris Gupta P. Eng

Question

- Would the city recklessly add 0.7 parts per million of lead to the drinking water as it does Fluoride?
- Of course not.

Chris Gupta P. Eng

Ethical Dentists

- The following critic is not aimed at all dentists.
- Most dentists are doing what they have been fed by the various dental associations and public health units.
- With a few exceptions many are afraid to speak out as they are under the threat disciplinary action from their dental associations.

Chris Gupta P. Eng

Toxic Health Effects

- Even though Fluoride is a known toxin, we've also been told it's essential for healthy teeth.
- Are we to take it that something more toxic than lead has just one effect.
 - Dental fluorosis.
- This is not simply cosmetic: It is damage to the protective enamel of the teeth requiring expensive cosmetic surgeries to repair...

Chris Gupta P. Eng

Fluoridated Vs Non Fluoridated areas

- Teeth are not falling out in non fluoridated areas as we are lead to believe.
- *62% of Canada is not Fluoridated!*
- 99% of Europe is not Fluoridated.
- Their teeth are as good if not better. (See appendix)

Chris Gupta P. Eng

Follow the Money

- It is a well known fact that fluoridated areas have much higher dental Fluorosis. A pathological condition which clearly is damage to the teeth requiring profitable and expensive cosmetic surgeries to repair...
- **Fluoridated areas require more dental visits.**

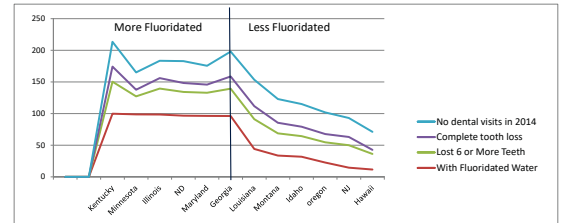
Chris Gupta P. Eng

Tooth loss comparison and fluoridation rates from the CDC's own data

Extracted from: <https://www.cdc.gov/oralhealthdata/index.html>

CDC data 2014	Kentucky	Minnesota	Illinois	ND	Maryland	Georgia	Louisiana	Montana	Idaho	oregon	NJ	Hawaii
% of Population With Fluoridated Water	99.9	98.8	98.5	96.7	96.4	96.2	44.2	33.7	31.9	22.6	14.6	11.7
Lost 6 or More Teeth	50.5	28.3	41	37.4	36.5	43.1	47	35.1	32.5	32.1	35.5	24.6
Complete tooth loss	23.9	10.5	16.5	14.3	12.9	19.3	20.5	16.7	14.9	12.9	13	6.4
No dental visits in 2014	39	27.4	27.4	34.5	29.8	39.4	41.7	37.4	35.7	34.3	29.9	28.4

Tooth Loss in Adults 65+ Due to Decay and Gum Disease
Depends on Dental Visits - NOT Fluoridation



Again it's all about the Money

- According to CDC database:
- **Fluoridated areas have more dental visits.**
- Cavity repair is cheap = \$120
- Fluorosis repair is expensive:
 - Micro-abrasion plus bleaching (\$1000/treatment)
 - Additional composite fillings (+\$1000)
 - Porcelain veneers (\$15,000/case)

Chris Gupta P. Eng

Example

- Pre-school children's tooth decay rates nearly doubled after fluoridation became Kentucky law.
- In 1987, 28% of Kentucky preschoolers developed cavities. That number increased to 47% in 2001, according to the July/August 2003 journal, "Pediatric Dentistry." <https://tinyurl.com/kqmmqv5>
- In addition to tooth decay we know that there will be more fluorosis.

Chris Gupta P. Eng

Follow The Money

- TOTAL COST TO TREAT DENTAL FLUOROSIS in London Ont. over the next 40 years = \$41.5 million.
- See attached work up by Hardy Limeback, BSc, DDS, PhD, retired head of Preventive Dentistry, University of Toronto Faculty of Dentistry

Chris Gupta P. Eng

Costs

- And this does not include the cost of water fluoridation!
- Nor are all the health costs from fluoride toxicity. Some of these can be very high like loss of IQ from neurotoxins such as fluoride and lead.
- Clearly their ridiculous pleas to protect teeth is all about the money and has little to do with teeth!

Chris Gupta P. Eng

Water Fluoridation is Profitable

- The waste companies get to dispose their toxins with a profit to boot!
- The dentists get more business.
- They both lobby the authorities to do their bidding.
- Is it any wonder that they love water Fluoridation?

Chris Gupta P. Eng

Conclusion

- Health Canada has no safety studies on water Fluoridation Chemicals.
- Health Canada & MOH can't account for fluoride from all sources and have no clue of the health of the recipients.
- They deliberately confuse water level/concentrations with dose which clearly are not one and the same.
- They call tooth damage "alteration of the appearance".

Chris Gupta P. Eng

Conclusion (Con't)

- *The fact is that the vast number of countries and jurisdictions in our world don't put toxins into their water systems at uncontrolled doses and dosages, without informed consent, and without any form of ongoing monitoring or follow-up.* Dr. Robert C Dickson, MD, CCFP, FCFP
- As conscientious, moral and ethical Councilors it is incumbent upon you, as the ultimate decision makers, to protect the health and well being of the residents
- You were elected to Serve And Protect. It behooves you to stop this fraudulent practice like most of the world has done.

Chris Gupta P. Eng

- "Where is the physician who will impose a lifelong prescription for an untested potentially toxic substance, without proven clinical benefit, on a patient he/she has never met, interviewed or examined?"
- Such dubious behavior would extract appropriate censure from the licensing authority of the physician involved, on the basis that it is unscientific, unscrupulous, unethical, and therefore unacceptable."

~Dr. Neville Wilson

Chris Gupta P. Eng

Appendix

- Fluoride-Efficacy
- The Cost Of Fluoridation In London

Chris Gupta P. Eng

Is Water Fluoridation Effective?

According to most major sources, estimates of fluoridation effectiveness amount to at most a reduction of only one-half cavity per child. Low end estimates find **no significant reduction at all**. Children aged 6-17 average 2.1 cavities in their permanent teeth¹:

- Cochrane Collaboration² (2015): 26% **(0.5 cavity per child)**
- CDC³ (2018): 25% **(0.5 cavity per child)**
- Iowa Fluoride Study⁴ (2018): **No significant reduction**
- World Health Organization data⁵ (2005): **No evidence of fluoridation's effectiveness**



There is already a consensus including CDC, Cochrane Collaboration, the Iowa Fluoride Study and others that fluoride's effectiveness in preventing cavities is mainly topical (not swallowed).

The **Cochrane Collaboration** is considered the gold standard of evaluating effectiveness. It said the cavity reduction referenced above was **"based predominantly on old studies and may not be applicable today."**

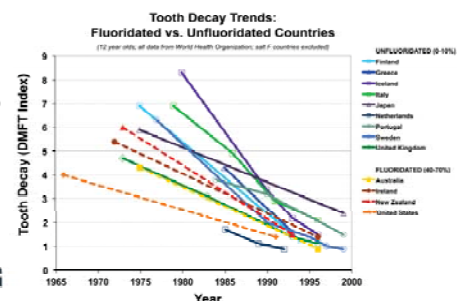
"Over 97% of the 155 studies were at a high risk of bias, which reduces the overall quality of the results... We did not identify any evidence... to determine the effectiveness of water fluoridation for preventing caries in adults... There is insufficient evidence to determine whether water fluoridation results in a change in disparities in caries levels across socio-economic status."

The **Iowa Fluoride Study (IFS)**, funded by the National Institutes of Health, is the most comprehensive, ongoing research project in the U.S., the only one measuring all sources of fluoride ingestion. The 2018 study from IFS referenced above found no significant correlation between ingested fluoride and cavity reduction, further validating a 2009 study⁶ from IFS that stated:

"... achieving a caries-free status may have relatively little to do with fluoride intake (emphasis in the original) ... recommending an 'optimal' fluoride intake is problematic."

Finally, World Health Organization data show cavity rates in children (age 12) have dropped as much in nations that don't fluoridate (darker solid lines) as in nations that do (red/yellow dotted lines). (See graph)

1. Shade et al. 2018, *Journal of Dental Research*, <https://www.ncbi.nlm.nih.gov/pubmed/2990886>
2. Cochrane Collaboration, 2015, <https://www.cochrane.org/CD010856/ORAL/water-fluoridation-prevent-tooth-decay>
3. CDC, 2018, <https://www.cdc.gov/fluoridation/index.html>
4. Curtis et al. 2018, *Journal of Public Health Dentistry*, <https://www.ncbi.nlm.nih.gov/pubmed/29752831>
5. Neerath, 2005, *Fluoride*, <http://www.fluorideresearch.org/384/Files/384324-325.pdf>
6. Warren et al. 2009, *Journal of Public Health Dentistry*, <https://www.ncbi.nlm.nih.gov/pubmed/19054310>



THE COST OF FLUORIDATION IN LONDON, ONTARIO- is it worth it?

The City of London claims it only cost \$82,457 in 2017 to fluoridate London.
(email from Dan Huggins, Thursday, March 15, 2017, 11:38 a.m.)

This is JUST the cost of fluoridation chemicals (a cheap industrial waste product called hydrofluosilicic acid, or HFSA). It does not include the cost of other chemicals added because HFSA is used, F testing, record keeping and reporting, extra hazmat precautions and training, F equipment maintenance, upgrades & replacement, fluoridation promotion, added liability insurance and legal fees, holding fluoridation plebiscites, dealing with HFSA spills and fluoridation overfeeds.

A realistic estimate of the *direct* cost to fluoridate London is \$0.3 M/yr.
= (\$0.3M/yr X 40 years = \$12 million.

Fluoridation promoters never consider the cost to families that avoid fluoride because of sensitivities, the cost of treating objectionable fluorosis, or the costs of treating other fluoride-related health problems.

The cost of treating dental fluorosis in London

London has about 384,000 people. Over the next 40 years there will be 5 cohorts of children of tooth forming age (birth to age 8), or about 250,000 children exposed to added fluoride in the drinking water.

1 in 10 = 25,000 children will have objectionable dental fluorosis and will likely want it treated cosmetically
if 15,000 have micro-abrasion plus bleaching (\$1000/treatment) = \$15 M
if 9,500 have additional composite fillings (+\$1000) = \$19 M
if 500 (only 0.2% of all the children) have porcelain veneers (\$15,000/case) = \$7.5 M

TOTAL COST TO TREAT DENTAL FLUOROSIS over the next 40 years
= \$41.5 million

Total fluoridation costs (related to teeth only) = \$53.5 million.

Dental expenses expected to be saved related to dental cavities prevented.

Fluoridation has to be maintained for about 40 years to save one tooth per person from a filling (<https://www.ncbi.nlm.nih.gov/pubmed/23456704>)
384,000 persons in London X 1 filling (\$120/filling) per person = **\$46.1 million**

THERE ARE NO COST SAVINGS TO FLUORIDATE

**Hardy Limeback, BSc, DDS, PhD, retired head of Preventive Dentistry,
University of Toronto Faculty of Dentistry**

To: Chair and Members of the Civic Works Committee
From: Christopher Mackie, MD, MHSc, CCFP, FRCPC
Medical Officer of Health and Chief Executive Officer
Subject: Water Fluoridation
Date: February 5, 2019

Recommendation

As the Medical Officer of Health for London and Middlesex, I have a mandate to protect and promote public health and safety. Upon review of evidence-based research, data and information regarding water fluoridation, I strongly support and recommend that the City of London continue to practice water fluoridation at the optimal level of 0.6 mg/L – 0.8 mg/Lⁱ, as a safe, beneficial, equitable and cost-effective measure to provide all residents of London with protection against tooth decay.

Key Points:

- Water fluoridation is safe and improves and promotes the oral health of all residents, regardless of their socioeconomic status or whether they have dental insurance.
- Tooth decay is the single most common chronic childhood disease. The Middlesex-London Health Unit estimates that if water fluoridation were discontinued, London children would experience at least 40,000 additional cavities over the next ten years.
- There is no evidence to support a link between exposure to fluoride in drinking water at the levels used in London and any adverse health effects, such as any types of cancer, developmental defects, neurobehavioral effects, or genotoxicityⁱⁱ.
- In Calgary, a recent study found that there was a worsening in tooth decay for primary teeth since that city discontinued fluoridation in 2011, as compared to Edmonton, where water is still fluoridated. The number of tooth surfaces with decay per child increased by 3.8 surfaces in Calgary during the time frame of the study, as compared to only 2.1 in Edmontonⁱⁱⁱ.
- Windsor, Ontario recently voted to resume water fluoridation due to the strong science that it is safe and effective.
- In Juneau, Alaska, 12 years after that community stopped water fluoridation, children under 6 are experiencing one additional cavity per year, which translates to an expense of about \$300 per child^{iv}.
- An economic review of multiple studies found that savings for communities ranged from up to \$135 for every \$1 investing in water fluoridation^v.
- 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, the National Institutes of Health and the World Health Organization endorse the fluoridation of drinking water to prevent tooth decay, especially among children.

Fluoride

The Canadian Dental Association asserts that water fluoridation is a safe and effective mechanism for preventing cavities in all age groups. Public health authorities across North America endorse fluoridation of community water supplies as a significant component of enhanced dental health. The U.S. Centers for Disease Control identifies it as one of 10 great public health achievements of the 20th century.

Fluoride is a naturally occurring mineral present in nearly all water sources. It supports oral health by making the outer layer of teeth stronger and less likely to get cavities. It can also help prevent and reduce tooth decay. When ingested, fluoride becomes part of the tooth structure during tooth formation and provides topical protection as it is retained in saliva and continually surrounding the tooth. When added to drinking water systems, fluoride is classified as a direct additive or a drinking water treatment chemical.

Wide-scale supplementation of food and beverages is a well-established public health approach that has been used for over 100 years. Similar interventions are iodine supplementation of table salt to prevent thyroid tumours, vitamin D supplementation of milk to prevent rickets, and folic acid supplementation of flour to prevent birth defects.

Over the last five years in Ontario, fluoridated water systems coverage increased from 67% of the population in 2012 to 71% in 2017. The City of London has practiced water fluoridation since 1967. Fluoridated drinking water has been proven effective at reducing the number of cavities in children's teeth, as well as adults, which contributes to their healthy development.

Tooth decay is the single most common chronic childhood disease - 5 times more common than asthma, 4 times more common than early- childhood obesity, and 20 times more common than diabetes^{vi}. In Canada, tooth decay accounts for one-third of all day surgeries performed on children between the ages of 1 and 5^{vii}.

While the majority of studies have described the positive impacts of fluoridation on the dental health of children, there are also studies that establish a benefit for adults, and particularly older adults. Caries reductions of approximately 15-35% have been observed in adults and seniors who reside in communities with fluoridated water. Older adults are especially vulnerable to tooth decay. This is linked to a variety of factors, including gum recession and decreased saliva production associated with certain medications prescribed to treat chronic illness.

An economic review of multiple studies found that savings for communities ranged up to \$135 for every \$1 investing in water fluoridation^{viii}.

Oral Health Inequities

It has been well established that the benefits of fluoridation are greatest for people who live in conditions of material deprivation. Community level factors such as housing, education, income and access to oral health care greatly influence health and contribute to inequity in oral health status. Water fluoridation promotes equality amongst all segments of the population, particularly the underprivileged and the hardest to reach poor for whom other preventive measures, such as regular dental visits, may be inaccessible.

London elementary school screening data in 2017-2018 showed that 1,776 students (11.1%) of those screened were found to have urgent dental needs which deemed them clinically eligible to receive Healthy Smiles Ontario. Tooth decay can cause pain, school and work absences, difficulty concentrating and cosmetic issues. Even with government programs like Healthy Smiles Ontario, dental services are extremely underutilized, with a majority of services being paid out-of-pocket.

Quality of Research and Systematic Appraisal

Even in the peer-reviewed literature, there are many studies that either paint an incomplete picture, or are based on methods of varying quality. As such, MLHU is committed to identifying and reviewing research to identify the best available evidence, and to seek a balanced understanding of the issue at hand. MLHU critically and objectively appraises the relevant evidence for quality, interprets the findings, and applies the findings to the local context.

Where available, systematic reviews, rather than single studies, are a more appropriate guide for decisions. Systematic reviews compile the results from many high quality single studies to come to a well-grounded conclusion about a topic. To assess quality, research evidence is critically appraised to determine if methods controlled for different types of bias. “Bias” in the context of health research is defined as systematic errors in the way the study is designed, conducted or interpreted that could affect the study results.

The Hierarchy of Quantitative Evidence

What is the best available evidence?

The hierarchy of evidence attempts to address this question. It uses a top-down approach to locate the best evidence by searching for systematic reviews or meta-analyses.

If these are not available, the researchers move down to the next level that is appropriate to answer the research question.

The hierarchy ranks study types based on the rigour (strength and accuracy) of their research methods.

The higher up the study design is positioned, the more rigorous the methodology and more likely that the study design is able to minimize bias on the study results.

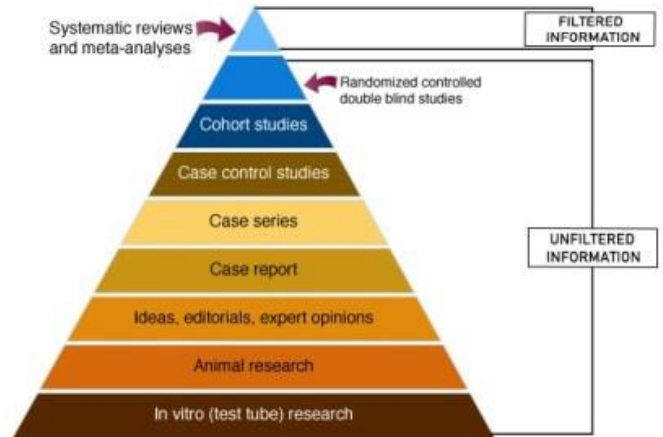


FIGURE 1: The hierarchy of quantitative evidence

Health Canada and Public Health Ontario Peer-Reviewed Evidence

Health Canada plays a major role in providing the scientific and technical basis for the drinking water standards that are implemented by the province. In 2010, Health Canada reviewed over 430 studies, including chronic toxicological studies, to determine that the consumption of fluoridated water at the optimal level did not pose a risk to human health^{ix}.

In October 2018, Public Health Ontario (PHO), an organization that provides scientific evidence and expert guidance that shapes policies and practices to prevent illness and improve health, released its Evidence Review for Adverse Health Effects of Drinking Optimally Fluoridated Water^x. This review provides a summary of the evidence published since the 2010 Health Canada fluoride document regarding the adverse health effects of optimally controlled fluoridated water with a scope specific to optimally controlled fluoridated community drinking water.

PHO reported that studies conducted and the organizational reports published after the 2010 Health Canada fluoride document corroborate the Health Canada findings there is no evidence to support a link between exposure to fluoride in drinking water at or below 1.5 mg/L (Health Canada’s maximum acceptable concentration^{xi}) and any adverse health effects such as any types of cancer, developmental defects, neurobehavioral effects, or genotoxicity^{xii}. The existing literature indicates that mild dental fluorosis (generally unnoticeable white specks on teeth) is the only adverse effect experienced from the consumption of optimally fluoridated water.

Like any substance, exposures to very high doses can cause health issues, including bone problems. These health issues are not a concern with the low levels of fluoride added to London's water.

Given that the studies included in PHO report assessed the impact of optimally fluoridated water and most of them were from countries that have similar demographic and socio-political environments, their findings can be generalized to the Canadian context.

Studies on water fluoridation continue to emerge, and several additional studies were published in 2018. MLHU has reviewed these, and they do not change the conclusion that water fluoridation is safe and effective.

Ending Fluoridation Would Present Risks to the Health of Londoners

Using data from the recent studies in Calgary and Alaska, we can estimate the impact that discontinuing water fluoridation might have in London. These studies and others demonstrate that discontinuing water fluoridation would result in an increase of approximately 1 to 1.7 cavities per child. If we use the lower figure to generate a conservative estimate and consider that there are over 4,000 births in London each year, we can see that:

Minimum of one excess cavity per child X 4,000 children born each year X 10 years = 40,000 additional cavities

This figure is almost certainly a low estimate due to the conservative figures used for both the number of children, and the number of additional cavities per child.

Conclusion

Fluoridation of drinking water is still the most economical means of getting the proven protection that fluoride gives to the oral health of all residents, regardless of socio-economic status. Where fluoride has been added to municipal water supplies, there has been a marked decline in tooth decay rates; recent studies have also shown that its removal resulted in increased dental caries. In addition, evidence-based research, data and information regarding water fluoridation have found no evidence to support a link between exposure to optimally fluoride levels in drinking water and any adverse health effects such as any types of cancer, developmental defects, neurobehavioral effects, or genotoxicity.

-
- ⁱ Safe Drinking Water and Fluoride Monitoring Protocol, 2018. Ontario Public Health Standards, (2018).
- ⁱⁱ [Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride 2010](#)
- ⁱⁱⁱ McLaren, Lindsay & Patterson, Steven & Thawer, Salima & Faris, Pd & Mcneil, Deborah & Potestio, Melissa & Shwart, Luke. (2016). Measuring the short-term impact of fluoridation cessation on dental caries in Grade 2 children using tooth surface indices. Community dentistry and oral epidemiology.
- ^{iv} [Consequences of community water fluoridation cessation for Medicaid-eligible children and adolescents in Juneau, Alaska, \(2018\).](#)
- ^v Ran, T., S.K. Chattopadhyay, and Community Preventive Services Task Force, Economic Evaluation of Community Water Fluoridation: A Community Guide Systematic Review. Am J Prev Med, 2016. 50(6): p. 790-6.
- ^{vi} American Academy of Pediatric Dentistry
- ^{vii} The State of Oral Health in Canada. (2017).
- ^{viii} Ran, T., S.K. Chattopadhyay, and Community Preventive Services Task Force, Economic Evaluation of Community Water Fluoridation: A Community Guide Systematic Review. Am J Prev Med, 2016. 50(6): p. 790-6.
- ^{ix} [Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride 2010](#)
- ^x [Ontario Agency for Health Protection and Promotion \(Public Health Ontario\). Evidence review for adverse health effects of drinking optimally fluoridated water: evidence since the 2010 Health Canada fluoride document. Toronto, ON: Queen’s Printer for Ontario; 2018.](#)
- ^{xi} [Health Canada](#)
- ^{xii} [Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride 2010](#)

Fluoridation of the City of London's Drinking Water

Why is fluoride added to drinking water?

Fluoride is added to drinking water to prevent cavities in children and adults. Cavities are one of the most common health conditions in children. Approximately half of all children have had at least one cavity. Preventing cavities in adults is also very important because more adults are keeping their teeth as they age and few programs exist to help adults who cannot afford dental care.

If left untreated, cavities can lead to pain, infection of the mouth and occasionally in the body, and tooth loss. Tooth loss can result in difficulties eating and speaking and poor self-esteem. Treatment of cavities results in missed time from school and work, is costly, and sometimes needs to be done under general anesthetic.

How does fluoride work to prevent cavities?

Cavities are the result of acid in the mouth that removes minerals from the enamel on the surface of the teeth. Acid forms when bacteria in the mouth react with sugars in food or drinks. Fluoride works by stopping or even reversing the effect of acid on the enamel. Fluoride also makes the teeth stronger in order to resist the effects of the acid.

Fluoride's main effect occurs after the teeth have erupted into the mouth, as small amounts of fluoride in saliva bathe the tooth. Even with other sources of fluoride available, fluoridation of drinking water results in approximately an additional 15% of children having no cavities.

Is fluoride safe?

The levels of fluoride used in London's drinking water are safe. A small number of people will develop a cosmetic condition called dental fluorosis. At the levels of fluoride in London's drinking water, this can appear as a few white spots that are usually undetectable except by a dental professional.

A study by Health Canada found very little fluorosis among Canadian Children – 4% of children had mild fluorosis and 12% had very mild fluorosis; no severe fluorosis was noted and hardly any moderate fluorosis was noted in the study. High levels of fluoride in water, such as those in other countries where fluoride occurs naturally in water, can cause moderate or severe dental fluorosis. In these cases, the spots can be brown and more noticeable. Fluorosis results from fluoride exposure when the teeth are forming, and is mostly a problem in the permanent front teeth which form at around 22 to 26 months of age.

Numerous reviews, including a recent review by Health Canada, have not identified any other risks from the levels of fluoride added to London's drinking water. Specifically, the reviews did not identify any risk of fractures, thyroid problems or cancer and no effects on IQ. Like any substance, a very high level exposure can cause health risks such as increased risks of bone problems. These risks would only occur at much higher levels of fluoride exposure than London's drinking water.

How much fluoride is added to London's drinking water?

Fluoride is added to London's drinking water to bring the levels to 0.7 mg / litre (mg/L) or parts per million (ppm). This is the level recommended by Health Canada to prevent tooth decay and minimize the risk of dental fluorosis. The level of fluoride in the drinking water is closely monitored by the City of London and the Middlesex-London Health Unit.

What else should be done to decrease the risk of dental fluorosis?

The risk of fluorosis increases when young children swallow fluoridated toothpaste. To decrease this risk, it is recommended that children less than 3 years of age not use fluoridated toothpaste, unless suggested by their dentist. For children 3 years of age and older, only a rice grain size amount of fluoridated toothpaste should be used and children should be encouraged not to swallow the toothpaste. Children 3 to 6 years of age should be helped by an adult with brushing their teeth. In fluoridated areas, children should not receive fluoride supplements such as pills or drops.

Can London's water be used to mix infant formula from liquid concentrate or powder?

Yes, there is no problem mixing infant formula from concentrate or powder with London's water. The fluoride in formula comes mainly from the water and not the formula itself. Children drink formula when they are very young; this is followed by lower levels of fluoride intake as they switch to solid food. The main risk for fluorosis of the permanent front teeth is between 22 and 26 months of age, when children are no longer drinking formula.

Does fluoride in water affect the environment?

Fluoride concentrations in water is reduced by treatment in the sewage treatment plant and by mixing with water in the river into which waste water flows. At this very low concentration, there are no known effects on the environment.

What is the history of fluoride in London's drinking water?

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.

How is fluoride added to London's drinking water?

Hydrofluorosilicic acid (also called hexafluorosilicic acid, fluorosilicic acid or fluosilicic acid) is the product used to add fluoride to London's drinking water. 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 phosphorus being used to create phosphoric acid, which is used as a food additive and as an ingredient in 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 required for the water industry such as the National Sanitation Foundation and American National Standards Institute (NSF/ANSI) Standards. Hydrofluorosilicic acid dissolves completely when added to water. The NSF 60 standard for fluoridation products provides a toxicological assessment of the components of hydrofluorosilicic acid after they have dissolved in water. This ensures the product is safe at the levels used to fluoridate water.

What is the cost of fluoridating London's drinking water?

In 2017, the cost to purchase London's fluoride was \$82,457. The amortized capital equipment costs and annual operating expenses brought the total cost of fluoridation to approximately \$98,000 in 2017, or about 26¢ per Londoner. It is estimated that for every \$1 invested in water fluoridation, \$38 in dental treatment costs are avoided. People who do not have dental insurance can end up in the emergency room for treatment. If water fluoridation were discontinued, the Middlesex-London Health Unit estimates that London's children would have at least 40,000 additional cavities over the next ten years. Many of these children would end up seeking care in London's emergency rooms. This expensive service model would place an even greater strain on the healthcare system.

How widespread is fluoridation of water?

The Ontario Ministry of the Environment, Conservation and Parks (MECP) estimates that 70% of Ontario residents receive water that is fluoridated, either naturally or by adding fluoride to the water. As of 2017, fluoridated drinking water was provided to approximately 39% of Canadians. In the United States, approximately 74% of the population receives optimally fluoridated water. Fluoridation of drinking water is less common in European countries, although some countries fluoridate their salt.

Which organizations support the fluoridation of water?

Many public health, medical and dental / oral health organizations support the fluoridation of drinking water 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. 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.

Where can I get additional information about fluoride and dental health?

Additional information is available on the Middlesex-London Health Unit web site at www.healthunit.com Click on Dental Health and follow the link to water fluoridation. You can also call the Middlesex-London Health Unit at 519-663-5317 ext. 2330.

To speak to a Public Health Inspector on the Environmental Health Team about drinking water or water quality, please call 519-663-5317 ext. 2300.

Evidence Review for Adverse Health Effects of Drinking Optimally Fluoridated Water (2010- 2017)



November 2018

Public Health Ontario

Public Health Ontario is a Crown corporation dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, frontline health workers and researchers to the best scientific intelligence and knowledge from around the world.

Public Health Ontario provides expert scientific and technical support to government, local public health units and health care providers relating to the following:

- communicable and infectious diseases
- infection prevention and control
- environmental and occupational health
- emergency preparedness
- health promotion, chronic disease and injury prevention
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Contents

Key Messages.....	1
Background	2
Purpose	3
Methods.....	4
Main Findings.....	5
Quality appraisal of included articles.....	5
Organization of Findings	5
Developmental defects of teeth	5
Infant formula with fluoridated water and fluorosis.....	7
Bone Health including skeletal fluorosis, bone mineral density, and fractures	8
Cancers including osteosarcoma	8
Reproductive/developmental effects	9
Neurobehavioral effects	9
Mutagenicity/genotoxicity.....	9
Hypothyroidism.....	9
Kidney Stones/Urolithiasis	10
Discussion and Conclusion	11
Limitations	12
Implications for Practice	12
Appendix A: Background from the 2010 Health Canada fluoride document.....	13
Developmental defect of teeth including dental fluorosis, enamel opacities, and hypo-mineralization	13
Dental Fluorosis	13
Infant formula with fluoridated water and fluorosis.....	13
Bone Health including skeletal fluorosis, bone mineral density, and fractures	14
Cancers including osteosarcoma	14
Reproductive/developmental effects	14
Neurobehavioral effects	14
Mutagenicity/genotoxicity.....	14
Hypothyroidism.....	15
Kidney Stones/Urolithiasis	15

Appendix B: Studies published subsequent to the search date of articles for this report 16
References 17

Key Messages

- The existing literature (to May 10, 2017) indicates that mild dental fluorosis (generally unnoticeable white specks on teeth) is the only adverse effect experienced from the consumption of optimally fluoridated water (Health Canada recommends the optimal level of fluoride in water at 0.7 mg/L).
- Infant formulas mixed with optimally fluoridated water may increase the chance of the mild form of dental fluorosis if they are the child's main food source. If prevention of the mild form of fluorosis is desired then infant formula can be occasionally mixed with low-fluoridated bottled water.
- If prevention of the mild form of fluorosis is desired, early exposure to other forms of fluoride including fluoride toothpaste, fluoride rinse, and fluoride supplements should be monitored.
- Considering the dose-response relationship between the fluoride exposure and health effects, as a practice consideration it is important to fluoridate water at the optimal concentration, where a suitable trade-off is achieved (benefits are maximized and adverse effects are minimized).

Background

To reduce the burden of dental decay, community water has been fluoridated in parts of North America for more than 70 years.¹ According to the US Centers for Disease Control, community water fluoridation (CWF) is considered one of the top 10 public health achievements of the 20th century.² According to a position statement released by the Public Health Agency of Canada (PHAC), the advantage of CWF is that it benefits all residents of a community, irrespective of their age, oral health behaviours, socioeconomic status, education, employment, or access to dental care, making it a truly equitable public health practice.³

Fluoride occurs naturally in water and its concentration can vary widely. In the United States (US), the natural level of fluoride in ground water varies from very low levels of less than 0.1 mg/L to over 4 mg/L.⁴ Water fluoridation is a process of optimally adjusting the concentration of fluoride in community drinking water to help reduce tooth decay in the populations served. Health Canada recommends an optimal level of 0.7 mg/L and a maximum acceptable concentration of 1.5 mg/L. While the benefits of CWF in caries prevention are well documented,⁵ there is ongoing public debate regarding the continuation of CWF, given the availability of fluoride from other sources and concerns about adverse health effects.⁶

In 2010, Health Canada developed the “Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride”, to provide a better understanding about the different aspects related to fluoride including any adverse health effects.⁷ This technical document from this point onward is referred to as the 2010 Health Canada fluoride document. The 2010 Health Canada fluoride document summarized findings from reports and studies published in or before 2010, focusing on both effectiveness and adverse health effects related to consumption of fluoridated water. The main adverse effects examined in the 2010 Health Canada fluoride document included dental fluorosis, skeletal effects, cancers, reproductive/developmental effects, mutagenicity/genotoxicity, neurobehavioral effects, and urolithiasis (kidney stones).⁷

The full-text 2010 Health Canada fluoride document is available from the Health Canada website.

Following the release of the 2010 Health Canada fluoride document, research has continued looking for any relationship between fluoridated community drinking water and adverse health effects.

Purpose

Based on a request from public health units in Ontario, the purpose of this report is to provide a summary of the 2010 Health Canada fluoride document findings (Appendix A) and new evidence on adverse health effects of optimally controlled fluoridated community drinking water on humans, published since then.

It is important to note that the 2010 Health Canada fluoride document included all studies irrespective of the fluoridation level and source, and included human as well as animal studies.

The scope of the present report is *optimally* controlled fluoridated community drinking water and *humans*. Therefore, content from the 2010 Health Canada fluoride document that is beyond the present scope is not described here.

Methods

Public Health Ontario (PHO) Library Services completed a database search on May 10, 2017. Four electronic databases were searched (Ovid MEDLINE, Embase, CINAHL, and Dentistry) for literature from January 1, 2009 to May 10, 2017. Key search terms included, but were not limited to: fluoridation, community water, infant formula, risk, fluorosis, bone and cancer. Duplicate references were removed. In addition, a grey literature search was conducted to identify organizational guidelines, reports and position statements published after the 2010 Health Canada fluoride document.

Peer reviewed published articles were eligible if they represented primary findings from any study design, or syntheses of existing literature. Articles evaluating the effect of naturally fluoridated water (where the fluoride concentrations vary significantly) were not considered, as the intent was to assess the effect of optimally controlled fluoridated water. Also, no studies assessing the effect of fluoridated salt or milk were included in this review. In addition, with the focus on adverse health effects, any study assessing the benefits or effectiveness of fluoride in terms of reducing dental decay, was excluded.

Nine hundred articles were identified and 29 were included: two systematic reviews,^{5,8} 20 cross-sectional studies,⁹⁻²⁸ five prospective cohort studies,²⁹⁻³³ and two case control studies.^{34,35} All the included studies were observational in nature. The two included systematic reviews were appraised using the Health Evidence Quality Assessment Tool (HE).³⁶ The Newcastle-Ottawa Scale (NOS)³⁷ was used to assess the methodological quality of the observational studies (n=27).

The grey literature search for organizational guidelines, position statements, and reports yielded six documents; one each from the Public Health Agency of Canada (PHAC),³ Health Services Ireland,³⁸ Public Health England (PHE),³⁹ American Dental Association,⁴⁰ the Centers for Disease Control and Prevention (CDC),⁴¹ and the EU Scientific Committee on Health and Environmental Risks (EUSCHER).⁴² The grey literature was not appraised.

Main Findings

Quality appraisal of included articles

All included articles from the peer review literature were appraised according to the criteria of the relevant quality appraisal tools used. Additional published critiques,^{43,44} were considered to augment the quality assessment of two included articles.^{18,20} No studies were removed based on their quality appraisal score. In general, the included studies accounted for key methodological parameters such as representativeness and size of the study sample, relevant confounders (such as age, gender etc.), assessment of outcome, and reported adequate follow up periods. However, due to the observational nature of the included studies and the risk factor being fluoride exposure exclusively through community water, it may be difficult to control for other forms of fluoride exposure in respective studies' participants. This is not a reporting issue, but a general limitation for such studies. Similarly, blinding was not possible due to the nature of exposure under consideration i.e., difficult to blind participants to fluoride exposure. Exposure in included studies was assessed either by record linkage or was self-reported. Self-report has the potential to introduce bias. Details about article screening and the quality appraisal scores are available upon request.

Organization of Findings

The evidence in this report is organized by adverse health outcomes that include: dental fluorosis, enamel opacities, hypo-mineralization, and bone health, cancers including bone cancers, reproductive, neurobehavioral effects, mutagenicity, hypothyroidism, and urolithiasis. Broadly, these outcomes align with the 2010 Health Canada fluoride document. For the purpose of comparison, this report includes the relevant background information from the 2010 Health Canada fluoride document for each outcome (see [Appendix A](#)).

Developmental defects of teeth

One Cochrane systematic review,⁵ 12 primary studies, and two grey literature reports^{3,39} assessed the effect of water fluoridation on developmental defects of teeth. Of the 12 primary studies, three each were conducted in Brazil^{13,23,35} and England;^{11,15,22} two each in Australia^{10,26} and the US^{16,24} and one each in Hong Kong¹², and Switzerland.¹⁴

DENTAL FLUOROSIS

Consistent with the 2010 Health Canada fluoride document, the prevalence of mild or worse forms of fluorosis continued to vary across recent studies.^{13-15,22-24,26,35} Fluorosis presents as white specks on teeth and is generally unnoticeable.³ Assessed by the Thylstrup Fejerskov (TF) index (the levels range from TF0 to TF5; Public Health England considers a level of TF3 as mild or mild to moderate), the two communities in Brazil, starting fluoridation (0.7 mg/L) in different years (in 1971 and 1997), observed the fluorosis prevalence among 12-year-olds (in 2007) at TF3 level as 0.67% and 1.51%, respectively.¹³ In a study

done in Switzerland, 2.7% of 12-year-old children in a fluoridated community (0.8-1.0 mg/L) scored fluorosis level of TF3.¹⁴ An Australian study showed approximately 9.9% of 8 to 12-year-old children who were exposed to fluoridated water during at least the first three years of life having a fluorosis level of TF2 or more.²⁶ Pretty et al. found that the prevalence of fluorosis at levels TF3 or greater was 10% in fluoridated communities of England.¹⁵ The 2014 Public Health England's report (based on monitoring the effects of water fluoridation schemes on the health of people living in the areas covered) concluded that among 12-year-olds in fluoridated (1.0 mg/L) communities, the prevalence of TF2 was 9%; TF3 was 6%; and TF4 was 1%.³⁹

Assessing fluorosis by the Dean's index (the levels are: normal, questionable, very mild, mild, moderate and severe), a Brazilian study reported 2.6% of 12-year-old children have a mild or moderate form of fluorosis in a fluoridated community.³⁵ Another Brazilian study reported approximately 10% having mild and 1.5% with moderate form of fluorosis among 12-year-old children regularly exposed to fluoridated water.²³ In a US study, 3.5% children had mild and 1.1% had moderate forms of fluorosis in a fluoridated community.²⁴ Bal et al. reported that in Australia, a water fluoridation concentration of 1.0 mg/L was associated with 6% mild and 1.5% moderate or severe forms of fluorosis among 7 to 11-year-old children.¹⁰ Bal et al indicated that the relatively higher prevalence of fluorosis was related to the higher-than-optimal level of fluoride in drinking water and fluoridated toothpaste swallowing during early childhood.¹⁰ According to the Cochrane systematic review, with a fluoride level of 0.7 mg/L in water, approximately 12% of people can have mild or worse dental fluorosis.⁵

Similar to the 2010 Health Canada fluoride document, a position statement from the Public Health Agency of Canada (2016) reported that the most likely adverse effect of CWF is mild dental fluorosis, which causes white specks on teeth and is generally unnoticeable.³ In terms of levels, Health Canada (2010) concluded that a moderate level of dental fluorosis was the end-point of concern, and that the prevalence of very mild and mild dental fluorosis is of no concern. However, the Cochrane systematic review reported that mild or worse fluorosis might be an aesthetic concern.⁵ Of note, the various sources of evidence are not consistent in defining the endpoint of concern when it comes to aesthetics (i.e. mild vs. moderate fluorosis).

In terms of self-perception about the aesthetic impact of dental fluorosis, a Swiss study by Buchel et al. reported that fluorosis in communities with fluoridated water did not represent an aesthetic problem nor a public health concern.¹⁴ Interestingly, McGrady et al., in a UK study, found that teeth with a fluorosis level of TF1 and TF2 are ranked more favourably than TF0.²² Fluorosis, not as an outcome but as an attribute, was studied by Joaloso et al., who found that the milder forms of fluorosis do not affect the eruption time of teeth.¹⁶

ENAMEL OPACITIES AND HYPO-MINERALIZATION

In regard to the developmental defects of enamel, enamel opacities and hypo-mineralization have been reported as adverse health effects.

A repeated cross-sectional study in Hong Kong assessed diffused enamel opacities on maxillary incisors using data from 1983, 1991, 2001 and 2010, when fluoridation levels were 1.0, 0.7, 0.5 and 0.5 mg/L,

respectively.¹² The prevalence of opacities for the four observed years was 89.3%, 48.5%, 32.4% and 42.1%. The prevalence decreased from 1983 to 2001, but increased again in 2010, although fluoridation levels remained the same. The authors concluded that this change did not fully correspond to the concentration of fluoride in the drinking water during the time of enamel development, but could be due to exposure to other forms of fluoride.¹²

A study conducted in Northern England reported an 11% prevalence of molar and incisor hypo-mineralization in the fluoridated community, and 17.5% in the non-fluoridated community.¹¹ A higher prevalence of developmental defects including hypo-mineralization in the non-fluoridated community could be the effect of both fluoride and/or non-fluoride factors. Fluoride exposure could be because of the “Halo effect”, which is fluoride consumption in a non-fluoridated community from other sources such as foods and beverages manufactured using fluoridated water. Consumption of fluoridated toothpaste or fluoride supplements could also increase levels of systemic fluoride. Non-fluoride reasons could include physical injuries, systemic illnesses (for example, some neurological or endocrine disorders) or certain medications taken during childhood during the formative stage of tooth development, which can also result in such oral manifestations.¹²

Infant formula with fluoridated water and fluorosis

One systematic review from Australia,⁸ two primary studies (Australia, the U.S.),^{27,31} and two grey literature reports,^{40,41} assessed the effect of fluoridated water used to reconstitute infant formula on dental fluorosis.

Higher fluoride intakes from reconstituted powdered formulas and other water-added beverages at the age of 3-9 months increased the risk of mild fluorosis.^{27,31} Each 0.1 mg/L increase in fluoride level in the water that is mixed with infant formula was associated with a 5% increase in enamel fluorosis of any level.⁸ The authors concluded that infant formula mixed with fluoridated water is potentially associated with an increased risk of developing enamel fluorosis.⁸

According to an expert panel convened in 2011 by the American Dental Association (ADA), dentists can continue to advise parents and/or caregivers to reconstitute infant formulas with optimally fluoridated water while being cognizant of the potential risks of enamel fluorosis development.⁴⁰ According to the CDC, if a child is consuming only infant formula mixed with fluoridated water, the chances of developing faint white markings of very mild or mild dental fluorosis on teeth may be increased.⁴¹ The CDC advises the use of bottled water (low-fluoridated) sometimes instead of tap water (optimally fluoridated) to mix infant formula; it is important to note, “these bottled waters are labeled as de-ionized, purified, demineralized, or distilled, and without any fluoride added after purification treatment.”⁴¹ The Ontario Dental Association (ODA), citing both the ADA and the CDC, also states that if a “child is exclusively consuming infant formula reconstituted with fluoridated water, there may be an increased chance for mild enamel fluorosis, but enamel fluorosis does not affect the health of the child or the health of the child’s teeth.”⁴⁵

Bone Health including skeletal fluorosis, bone mineral density, and fractures

Four primary studies, two from the US;^{30,32} and one each from Canada⁹ and Ireland,¹⁹ and two grey literature reports^{38,39} assessed the impact of water fluoridation on physical and structural properties of bone. One additional study conducted in Sweden³³ assessed the impact of fluoride in drinking water on hip fractures. We did not identify any studies released since the 2010 Health Canada fluoride document to comment on the association with skeletal fluorosis.

The Canadian study compared the fluoride content and structural or mechanical properties of bone between adults from Toronto (fluoridated community) and Montreal (never fluoridated), and found a weak relationship among fluoride exposure, accumulated fluoride, and the physical characteristics (density and compressive mechanical property) of bone.⁹ The fluoride content of bone of Toronto residents was significantly higher ($p < 0.001$) than residents of Montreal; however, the range for the Toronto specimens fully included the range of the Montreal ones. Although, the mean density of cancellous cores of Toronto specimens ($0.90 \pm 0.04 \text{ g/cm}^3$) was significantly greater than Montreal ($0.75 \pm 0.05 \text{ g/cm}^3$), the density of cancellous cores in the study did not correlate closely with the fluoride content. Interestingly, a prospective US cohort study observed children from birth to adolescence, and performed gender-stratified analysis for 11-year-olds and found no associations between average daily fluoride intake and bone outcomes for girls (Spearman association between daily fluoride intake and DXA bone measures were $r = -0.01$ to 0.24), but found a non-significant positive association for boys (Spearman correlation of $r = 0.04$ to 0.24).³² In addition, when observing the same cohort at 15 years of age, the same study found fluoride exposures do not have significant effects on bone mineral measures.³⁰ The authors noted the need for additional research to better understand the potential gender and age-specific effects of fluoride intake on bone development.³²

A study in Ireland found no significant relationship between the proportion of households with a fluoridated water supply and bone health (index of bone stiffness calculated as a measure of bone mineral density).¹⁹ The Ireland Health Services report also found no association between fluoridation of drinking water at the recommended levels and risk of bone fracture.³⁸ According to the report from Public Health England, “there was no evidence of a difference in the rate of hip fractures between fluoridated and non-fluoridated areas.”³⁹ In the Swedish study, Nasman et al., found no association between chronic fluoride exposure from drinking water and the occurrence of hip fracture.³³

Cancers including osteosarcoma

Five primary studies, two from England,^{21,25} two from the US^{28,34} and one in Ireland,¹⁷ as well as two grey literature reports^{39,42} assessed the effect of water fluoridation on bone cancers.

Findings from the primary studies were consistent with the 2010 Health Canada fluoride document. None of the recent studies found a relationship between fluoridation and incidence rates of osteosarcoma at any age.^{17,21,25,28,34} Furthermore, Public Health England stated there was no evidence that osteosarcoma rates differed between fluoridated and non-fluoridated communities.³⁹ Also, Public

Health England stated there was no evidence for an association of fluoridated water consumption with bladder cancer and all cancers, in general. The EUSCHER report also concludes, “epidemiological studies do not indicate a clear link between fluoride in drinking water, and osteosarcoma and cancer in general”.⁴²

Reproductive/developmental effects

No peer-reviewed articles assessing the reproductive or developmental effects of fluoride in water were identified. Two grey literature reports discussed reproductive and developmental effects.^{39,42}

The Public Health England report stated there was no evidence of a difference in the rate of Down’s syndrome between fluoridated and non-fluoridated communities.³⁹ The EUSCHER concludes that fluoride at concentrations in drinking water permitted in the EU did not influence the reproductive capacity of males or females.⁴²

Neurobehavioral effects

Two primary studies, one in New Zealand²⁹ and another in the US,¹⁸ as well as one grey literature report⁴² assessed the neurobehavioral effects of fluoridated water.

The recent New Zealand prospective cohort study detected no clear differences in IQs between the fluoride-exposed (mean (SD): 100.0 (15.1)) and non-exposed group (mean (SD): 99.8 (14.5)), suggesting that community fluoridated water is not neurotoxic.²⁹

The US ecological study assessed the relationship between water fluoridation and Attention Deficit Hyperactivity Disorder (ADHD) among 4-17 year olds using administrative data.¹⁸ The authors concluded that states with a greater proportion of people receiving fluoridated water from public water supplies had higher proportions of parents reporting medically-diagnosed ADHD among their children, which warrants future studies to explore this relationship further.¹⁸ This study was critiqued by other researchers for methodological limitations including measurement error and no consideration for other potential explanatory variables (such as pre-term birth or exposure to tobacco, alcohol, arsenic or lead) apart from SES.⁴³ The results are advised to be interpreted with great caution due to high risk of ecological fallacy (water fluoridation measured at state level) and confounding bias.⁴³

The EUSCHER report concluded that based on available human studies, fluoride in drinking water at levels permitted in the EU does not impair children’s neurodevelopment.⁴²

Mutagenicity/genotoxicity

No studies assessing the impact of community-fluoridated water on mutagenicity/genotoxicity were identified. Future studies may be helpful to understand any potential relationship.

Hypothyroidism

One study, conducted in England, assessed the association of fluoridated water and hypothyroidism.²⁰

This study found that clinical practices located in fully-fluoridated areas are nearly twice as likely to

report high hypothyroidism prevalence in comparison to non-fluoridated areas.²⁰ This study was highly critiqued by scientists; Newton et al stated that the authors did not establish a clear prior hypothesis for the association, misrepresented the conclusions of the existing literature, did not adequately control for potential confounding variables, and categorised variables with arbitrary cut-offs that deviated from normal practice.⁴⁴

Current literature does not provide enough evidence to assess the relationship between the consumption of fluoridated water and hypothyroidism. Future studies with greater methodological rigour will be helpful in this regard.

Kidney Stones/Urolithiasis

One grey literature report assessed the impact of optimally fluoridated water on kidney stones.³⁹ No peer-reviewed studies were identified.

According to the Public Health England report, there was strong evidence that the rate of kidney stones was lower in fluoridated communities than in non-fluoridated areas following adjustment for age, gender, deprivation and ethnicity.³⁹ Future studies may be helpful to further understand any potential association.

Discussion and Conclusion

This report is a summary of the evidence published since the 2010 Health Canada fluoride document to May 10, 2017 about the adverse health effects of optimally controlled fluoridated water, including the effects when mixed with infant formula.

Overall, the existing literature suggests that at an optimal concentration of water fluoridation, the only adverse health consequence observed is a mild form of dental fluorosis. As the timing and dosage of fluoride exposure is critical in attributing the severity of dental fluorosis, the results of such studies further emphasize that early exposure to other forms of fluoride, including fluoride toothpaste, should be monitored to reduce cumulative fluoride exposure. For example, fluorosis was observed in some non-fluoridated communities as well.

Always mixing infant formula with fluoridated water has been recognized to increase the potential for mild dental fluorosis. Both Canadian and American organizations including ODA, ADA, and the CDC recommend occasional use of low-fluoridated bottled water as an alternative instead of always using optimally fluoridated tap water.⁴⁵

Attaining an optimal concentration of fluoride in community drinking water is considered crucial in establishing a trade-off between dental caries and dental fluorosis. A 2011 study by Frazão et al. analyzed the fluoride concentration in drinking water, taking into account the balance between the benefits and risks to health.⁴⁶ The authors concluded that fluoride levels should be between 0.6 and 0.9 mg/L in order to prevent dental caries, and that concentration > 0.9 mg/L presents a risk to the dentition among children under the age of 8 years.⁴⁶ The authors also concluded that, to reduce the proportion of children and adolescents with fluorosis levels of aesthetic significance, the water fluoridation levels should be in the range of 0.5 to 0.7 mg/L.

The 2010 Health Canada fluoride document states that there is no evidence to support a link between exposure to fluoride in drinking water at or below 1.5 mg/L and any adverse health effects such as any types of cancer, developmental defects, neurobehavioral effects, or genotoxicity.⁷ The studies conducted and the organizational reports published after the 2010 Health Canada fluoride document and until May 10, 2017 corroborate these findings.

Considering that the studies included in this report assessed the impact of optimally fluoridated water and most of them were from countries that have similar demographic and socio-political environments, their findings can be generalized to the Canadian context. Health Canada recommends water fluoridation at 0.7 mg/L, which is much lower than the maximum acceptable concentration of 1.5mg/L; therefore, the likelihood of any adverse health consequences at this concentration is low.

Limitations

This report is based on a review of recent studies conducted across a range of jurisdictions. Not all findings may be directly comparable to the Ontario context because of variations in exposures to other forms of fluoride, general oral health behaviours or access to the healthcare system, for example. In addition, our search focused on studies reported in the English language, which means some relevant literature could have been missed.

Implications for Practice

The fluoridation of community drinking water has been considered a safe and cost effective population-based approach to reduce dental decay. The current literature (to May 2017) has identified the mild form of dental fluorosis, which is not of health concern, as the only inadvertent effect of consuming drinking water fluoridated at optimal levels.

There is a dose-response relationship between fluoride exposure and health effects. Therefore, as a practice consideration, fluoridating water at an optimal concentration, where a suitable trade-off is achieved (benefits are maximized and adverse effects are minimized), is important.

The age of fluoride exposure is also an important consideration. Exposure during the first three to four years of life, during the formative stage of tooth development, is associated with increased fluorosis risk. As such, if a child is solely consuming infant formula, mixing it with low-fluoridated water on an occasional basis can reduce the risk of mild fluorosis. In addition, the consumption of fluoridated toothpastes and mouth rinses needs to be monitored.

The studies included in this report are those that were published until May 10, 2017. Evidence updates may be provided as new relevant evidence emerges.

Appendix A: Background from the 2010 Health Canada fluoride document

Developmental defect of teeth including dental fluorosis, enamel opacities, and hypo-mineralization

Dental Fluorosis

According to the literature synthesized in the 2010 Health Canada fluoride document, the “moderate level” of dental fluorosis (as per the Dean’s index) is the end-point of concern and the prevalence of “very mild” and “mild” dental fluorosis is of no concern.⁷ However, the 2010 Health Canada fluoride document also considers “mild” fluorosis or worse as dental fluorosis of aesthetic concern.

The risk for and severity of fluorosis is related to various aspects including the timing, dose and duration of fluoride intake (irrespective of the source).⁷ The period for susceptibility to dental fluorosis is during the first three to four years of life. Prolonged periods of fluoride exposure during the formative stage of tooth development is associated with increased fluorosis risk; however, if higher exposure is limited to the first year of life and the following years have low exposure it may not be as much of a concern. A suitable trade-off between dental caries and dental fluorosis appears to occur around 0.7 mg/L. At this level, both caries experience and fluorosis severity appear to be lower than that seen at 1.0 mg/L.

In regards to the prevalence of mild or worse forms of fluorosis, the Canadian Health Measures Survey (2007 to 2009) from the 2010 Health Canada fluoride document, shows 12.0% dental fluorosis classified as Very Mild, 4.4% as Mild, and only 0.3% had Moderate or Severe fluorosis among children 6-11 years old.⁷ As of 2008, 45.1% of Canadians had access to fluoridated water (usually at the level of 0.7 mg/L).

Infant formula with fluoridated water and fluorosis

Powdered infant formula reconstituted with fluoridated drinking water has a higher fluoride concentration than ready-to-use infant formulas. Among 7-12 month olds, if they are breastfed then the daily fluoride intake from food and beverages can be 0.017- 0.021 mg/kg-bw/day in a fluoridated community and 0.011- 0.012 mg/kg-bw/day in a non-fluoridated community.⁷ For non-breastfed infants, the intake can be 0.024 - 0.026 mg/kg-bw/day in a fluoridated community, and 0.013 -0.014 mg/kg-bw/day in a non-fluoridated community.⁷ Infant formulas with higher levels of fluoride can lead to an increased risk of mild dental fluorosis.

Bone Health including skeletal fluorosis, bone mineral density, and fractures

Skeletal fluorosis is an excessive accumulation of fluoride in bone resulting in increased bone density and outgrowths.⁷ Studies in the 2010 Health Canada fluoride document did not show any correlation of water fluoridation and skeletal fluorosis at concentrations of 1.2 and 3.3–6.2 mg/L for 10 years or more.

Regarding fractures, studies showed exposure to fluoride concentrations at 1.0-1.5 mg/L was occasionally associated with a positive effect on bone mineral density; however, it did not significantly increase the risk of fractures.⁷ Also, there was inconsistent evidence for an association between water fluoridation and increased risk of hip fracture, primarily because the incidence of hip fractures in several studies was too small to enable definitive conclusions about the risk of such fractures.⁷

Cancers including osteosarcoma

Reviews in the 2010 Health Canada fluoride document suggested no clear association between water fluoridation and overall cancer incidence including osteosarcoma.⁷ Some major challenges were recognized in assessing fluoride exposure as a risk factor for osteosarcoma. Firstly, the incidence of osteosarcoma is so low that not many studies are able to capture the new cases in a study population; secondly, it is difficult to estimate precisely the fluoride intake because of multiple sources of fluoride exposure; and lastly, the method of measuring fluoride in bones of studies participants' is too invasive.⁷

Reproductive/developmental effects

Only a few studies in the 2010 Health Canada fluoride document assessed the link between fluoridated drinking water and reproductive or developmental effects. No associations were found between fluoride intake and spontaneous abortions, congenital cardiac disease, or stillbirths.⁷ Infants exposed to fluoridated water supplies in utero were not at increased risk for sudden infant death syndrome (SIDS).⁷ In addition, there was inconclusive evidence of an association between water fluoride level and Down's syndrome.⁷

Neurobehavioral effects

A number of studies from China in the 2010 Health Canada fluoride document measured the impact of fluoride on children's intelligence quotient (IQ).⁷ The significance of these studies is uncertain and concern has been raised about their validity and generalizability, due to lack of methodological rigour and the dose of fluoride exposure (i.e., fluoride concentration of 4.12 mg/L) in those studies.⁷

Mutagenicity/genotoxicity

A study from China in the 2010 Health Canada fluoride document investigated the genotoxic risks of long-term ingestion of drinking water containing fluoride (0.2, 1.0, or 4.8 mg/L) in humans.⁷ Results showed numerically small but significant differences; subjects with low fluoride in the water (0.2 mg/L) had higher sister chromatid exchange (SCE) frequencies than those with optimal (1.0 mg/L) or higher (4.8 mg/L) fluoride exposures. Reasons for the reduced SCE frequency in subjects with optimal higher

fluoride exposure were unclear; however, authors concluded that long-term exposure to fluoride in the drinking water, even at an elevated level, does not have genotoxic effects in humans.⁷

Hypothyroidism

As per the 2010 Health Canada fluoride document, fluoride may adversely affect endocrine glands such as the thyroid.⁷ The effects of fluoride on thyroid function might depend on the intake of iodine, as there is an association of thyroid dysfunction with low iodine intake; however, in Canada, this is unlikely to occur because iodized salt is mandatory.

Kidney Stones/Urolithiasis

There were no studies in the 2010 Health Canada fluoride document that assessed the impact of optimally fluoridated water on the formation of kidney stones. Only studies from fluoride endemic areas (3.5 to 4.9 mg/L) found the prevalence of kidney stones was 4.6 times higher when compared to non-endemic areas.⁷

Appendix B: Studies published subsequent to the search date of articles for this report

The literature included in the above report included studies published between January 1, 2009 to May 10, 2017. Subsequent to that search, three published studies have assessed the effect of fluoride on adverse health outcomes.⁴⁷⁻⁴⁹ Of these three studies, two were conducted in Mexico and assessed the relationship between environmental fluoride exposures prenatally and neurobehavioral outcomes during childhood.^{47,49} As the fluoride exposure in these two studies was through fluoridated salt, and not fluoridated water, they do not meet the inclusion criteria of our review. That said, because it is important to assess the relationship of fluoride exposure and adverse health outcomes, these studies have been scientifically critiqued by PHO researchers and individual synopsis for both studies are available upon request.

The third study, which is conducted in Canada, meets the inclusion criteria of our review.⁴⁸ Malin et al., using a representative sample of Canadians from the Canadian Health Measures Survey (CHMS), determined if urinary iodine status modifies the effect of fluoride exposure on thyroid stimulating hormone (TSH) levels among moderately to severely iodine deficient adults. As for its main findings, authors state that 1 mg/L increase in specific gravity adjusted urinary fluoride (UF_{SG}) was associated with a 0.35 mIU/L increase in TSH (95% CI: 0.06, 0.64) among adults with iodine deficiency. These results are not clinically significant. The normal range for TSH, as stated by the authors, is 0.55 – 4.78 mIU/L. An increase of 0.35 mIU/L in the average or 90th percentile would still be within the normal range. No relationship was found between UF_{SG} and TSH in adults in the non-iodine deficient group.⁴⁸ As mentioned above for the two studies from Mexico, PHO researchers also conducted a scientific critique of this Canadian study; the complete synopsis is available upon request.

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To Civic Works Committee
City of London, Ontario

I understand that you will soon be once again faced with a decision on fluoridation.

You will surely be facing a barrage of promotion by many so-called experts.

However, experts on what?

Are they experts on fluoridation, fluoride, the Fluorine atom and the chemistry about these?

Are they experts on Toxicology, Pharmacology and water treatment?

Do you really know if the the purported benefits of fluoridation are truly substantiated or not?

Are those promoting fluoridation merely spouting unsubstantiated facts that they believe to be true?

Just because they make statements of support that appear to be with authority, does that mean they are authoritative?

Are their statements of support statements really and truly from independent science based researchers?

Yet is that not what you will be presented with?

Should you not beware of wolves in sheep's clothing?

Are their claim to be promoting tooth health for kids ignoring the deleterious effects to health now proven to exist from exposure to the Fluorine element in the form of fluoride?

Those who started this myth have done so with powerful and ingenious marketing and caused it to be perpetrated by convincing the medico-dental community to believe that it works as claimed.

Have you done your own due diligence on this matter?

Should you not be challenging those that want you to decide to medicate a whole population with an unproven medicinal product, one that is actually a toxic fluoride industrial waste banned by the US EPA as an environmental contaminant and the Canadian Environmental Protection Act (CEPA): WHMIS Ingredient Disclosure List says it's a corrosive, toxic substance?

Does the actual fluoride used for fluoridation become innocuous when diluted in treated water?

Do they really have the Toxicology Studies and Clinical Trials? have they actually provided them?

Should you not be asking them for actual, real, independent research that what they claim is actually true?

Should you not be listening to the voices of reason as opposed only to "expert" opinions?

Are you aware that over 5,000 professionals world wide have signed an open international letter asking

for this dangerous practice to be halted?

Are you aware there are now thousands of studies showing harm from ingestion of fluoride?

Aren't the claims made by fluoridationist simply just opinions that are not science based though they shamelessly claim that they are speaking on the strength of science based information?

Do you not have a duty to protect your constituents, especially children, from the effects of a bad decision based on bad or incomplete information given to you by persons who have a paycheck attached to their promotion of an unproved medical treatment?

As you listen to the barrage of promotion that you will be subjected to on the subject of fluoridation, will you please remember the above questions? especially also after reading the following information.

Thank you for reading this far and please read the following information.

What are the facts?

1. There are no Toxicology Studies and no Clinical Trials for the actual Hydrofluorosilicic acid (HFSA aka HFS) mixture and co-contaminants used in municipal treated water.
2. All water additives used in the water treatment process require Toxicology Studies and Clinical Trials before being used in the water treatment process, except for HFSA.
3. No HFSA batches are individually tested for the concentration of contaminants before being used in the water treatment processes.
4. HFSA is known for the following problems:
 - Highly corrosive and toxic effects.
 - Liver and kidney injuries may occur with chronic exposure even a very low levels.
 - Chronic exposure is known to cause dental and skeletal fluorosis.
 - many other health problems that have been documented over the last 60 years.
5. Canadian Environmental Protection Act (CEPA): WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2): - E Corrosive Material
6. This chemical can not normally be safely disposed of except as specified in accordance with the Hazardous Waste Act 2010 of Canada and similar regulations in the U.S.
7. HFSA is a known, banned US EPA environmental contaminant.
8. MSDS's for HFSA (Hydrofluorosilicic acid, HFS, Fluorosilicic acid) clearly state that the chemical is "Not for human consumption" - it's easy to look it up on the supplier's web site.
9. Fluoridation medically treats all consumers of municipally treated water without their explicit consent, without medical supervision, without medical follow up, without proof of lack of harm and without science based research on possible health effects; any doctor doing this would loose his license with any other drug treatment: why is HFSA exempted from such an exemption?
10. Fluoridation is the use of medical treatment using an unapproved chemical product mixture (HFSA) that does not have a DIN (drug identification number).
11. Lack of consent to medical treatment by any means, especially by fluoridated water, is an infringement of the human rights of all water consumers in any treated municipality.
12. The chemical mixture used is not the pure substance called Hydrofluorosilicic acid (HFSA), chemical formula H_2SiF_6 ; it is a liquid containing that contaminant and many other co-contaminants (Arsenic, Lead, Mercury, Radium, maybe even deadly Polonium, etc). It is the unpurified liquid resulting from the wet scrubbing of the smoke stack emissions (soot) of the phosphate fertilizer industry produced from their mining operations.
13. The Fluoride ion released in the water supply from the acid for the claimed purpose of

preventing tooth decay is a powerful ion of the Fluorine element that has the potential for disrupting and destroying human cells, RNA, DNA and organ functions, and has been shown by independent science based research to be generally and specifically harmful to life: the proof is easily available but ignored by medical authorities.

When you raise each of the above matters with these “experts” they will attempt to deflect them with some official sounding bafflegab or deflected by authoritative sounding statements of opinions that appear to contradict the evidence.

Should you believe them?

You might ask: “Why am I so opposed to fluoridation?”

Simple,

1. for all of the above 13 reasons, and,
2. because I am one of those members of a significant minority who must not ingest even the slightest amount of the Fluorine element or suffer dire consequences;
3. I have also informed myself of 100s upon 100's of research papers that show that ingestion of the Fluorine atom combine into any fluoride solution or compound
 - a) is absolutely contraindicated for any human being and
 - b) that it has no real benefits for teeth: “au contraire” it actually destroys normal enamel: figure it out.

Please add my letter to the agenda for the February 5, 2019 meeting of the Committee.

Thank you.

Sincerely

Richard Hudon, President
Safe Water Ottawa
3755 Loch Garry Rd
Apple Hill, Ontario, K0C 1B0
613-527-2589

From: Karen Spencer
Subject: Fluoridation submission for Civic Works Committee
Date: January 6, 2019 at 2:04:04 PM EST
To: csaunder@london.ca, cwc@london.ca

“Dental dogma and authoritative pronouncements aside, fluoride is not a nutrient of any kind - essential, non-essential or micronutrient. Consumption does not provide any dental benefit, and there is no such thing as a fluoride deficiency. Fluoride is best characterized as a poison that is used as a drug in a misguided attempt to prevent cavities.” - *prologue to “Open Letter to Nutritionists About the Fluoride Deception” published October 26, 2018 by GreenMedInfo LLC*

“Due regard is to be given to the interconnection between human beings and other forms of life, to the importance of appropriate access and utilization of biological and genetic resources, to respect for traditional knowledge and to the role of human beings in the protection of the environment, the biosphere and biodiversity.” - *UNESCO documents in Bioethics and Protection of the Environment, the Biosphere and Biodiversity, Article 17 (2005)*

Civic Works Committee -

Let me begin with an apology on behalf of approximately half of my American countrymen for the arrogant and often dishonest interference by the US that not only worsens the lives of those living in the United States, but also for those living in Canada and elsewhere. Those disinformation campaigns are truly abhorrent.

As someone with medical reason not to consume fluoride or foods prepared with fluoridated water, I became involved in the fluoridation issue in 2014. Frankly, prior to 2014 I thought that fluoridation had been confirmed as 'safe and effective' by my government and that opponents were crazy people. I've since found out that the crazy people are those in charge of fluoridation decisions - crazy like a fox as fluoridation and fluoridation promotion are profitable for them. For the public, especially for individuals like me, fluoride robs us of our lives.

I suffered for decades with diagnoses of irritable bowel syndrome, arthritis and chronic Lyme disease. I had daily dizzy spells, regular ringing in my ears, frequent kidney pain and for the last few years, chronic bodily pain and intermittent liver pain. I was once hospitalized with a liver swollen to over twice its normal size. Finally, in a fit of desperation and in my 60s and concerned that I would soon be in a wheelchair, I gave up my high quality water filter which only reduced the fluoride in my 'optimally' treated water in favor of bottled no-low fluoride spring water which I used even to brush my teeth. In less than 2 weeks all of these symptoms were gone. All of them. Since then, if I eat out I might get a

transient pain in my foot, or a short lived neurological symptom, but that's it. No more arthritis, bowel problems or dizzy spells after decades of 'living with it.'

As an analyst, I belatedly began to do my homework. I've read actual science published in PubMed, congressional reports and legal analysis on fluoridation published in every decade. The oldest item I read was from 1914, the most recent from January 2019. There is no doubt that scientists and government knew that a significant portion of the public would have their lives ruined but ignored those medical facts because of the loss of prestige and profit the fluoridation programs provided their organizations. Government was further motivated to promote the medical myth about fluoridation by the lobbying efforts of other stakeholders who included the sugar & pharmaceutical industries as well as corporate polluters. At this point in time, I am convinced that fear of liability claims is a significant motivation for fluoridationists. It has been projected that those claims will be akin to asbestos and tobacco.

Committee members, I can't get my life back. I can't undo the harm done to my family or myself by the fluoridation deception. However, I am bound by a moral imperative to use my talents to share what I've found in order to stop the continuation of this immoral medical mandate that causes misery in millions every day and damages our environment. Moreover, it's a false dilemma. Anyone who feels topical use of fluoride is insufficient can buy a gallon of drinking water for a dollar or less. On the other hand, those of us who must avoid it spend considerably more in an effort to not even wash our food with fluoridated water supplies, let alone eat out in our communities. Fluoridation is medical assault and battery. It creates an atmosphere of fear for those of us who must avoid it and when we periodically are exposed to what government recommends as a 'public health' intervention we suffer pain, a battery.

- However, your primary responsibility as a committee has to do with infrastructure and environment. You should know that 99% of fluoridation chemicals added to drinking water goes directly to wastewater. Moreover, 100% of the fluoridation chemicals we purchase are contaminated with tramp toxins like lead, arsenic, barium, etc. This corrosive and toxic brew further erodes infrastructure, consequently imposing both economic and environmental adverse impacts on your municipality.

I've put together a pdf of 'one pagers' for you, albeit 3 of the 9 being double sided. They include citations and hyperlinks specific to both health and environment. As well as viewing them online, I suggest you print them out as a handy reference. But first, let me suggest you take the time to check out the very recent items listed below:

ORGANIZATIONAL OPPOSITION:

2018 Letter with 100+ citations signed by 8 organizations: [http://](http://www.multibriefs.com/briefs/icim/nutrition.pdf)

www.multibriefs.com/briefs/icim/nutrition.pdf

2017 IAOMT webpage including position paper with 500+ citations: [https://](https://iaomt.org/resources/fluoride-facts/)

iaomt.org/resources/fluoride-facts/

VIDEOS ON SCIENTIFIC & HISTORICAL FACT:

Sept 2018 presentation at Otago University by environmental

scientist: <https://www.youtube.com/watch?v=h7JUYXNVmiw>

Sept 2018 presentation at Otago University by toxico-pathologist: [https://](https://www.youtube.com/watch?v=e0o3kxZNXCw)

www.youtube.com/watch?v=e0o3kxZNXCw

Sept 2018 interview about Europe: <https://youtu.be/fwukipamdxQ>

In closing, let me remind you that we once thought stuffing our schools full of asbestos was a good idea. More recently, we trusted the U.S. EPA who together with Monsanto tried to get the IARC to declare glyphosate/Round Up as safe. I'm sure most of you are aware of the emails and memos that have been uncovered that reveal collusion between the EPA and Monsanto to hide evidence of carcinogenicity to that chemical. Oh yes, there is considerable evidence of cancer from fluoride, too, although the most recent science linking long term fluoride use to dementia is even more compelling. I included a one pager on that.

It is the duty of the legislatures in both our countries to protect the individual and human rights of all its people as well as protect the environment and welfare of future generations. If any percentage of the consumers of fluoridated water suffer ill effects with the potential of ruining their lives with thyroid, kidney, autoimmune, and inflammatory diseases as well as with provoking learning disabilities and dementia, then dental dogma aside, no moral government has the right to play dice with its people's lives. To do so is a descent into the dystopian world of the *Hunger Games*.

Recommend your council consider the full picture and opt out of fluoridation policy.

Regards,

Karen Spencer

Sign the Petition: <https://petitions.moveon.org/sign/dietary-fluoride-and/>

See the Call to Action: <http://www.greenmedinfo.com/blog/open-letter-nutritionists-about-fluoride-deception>

More power to you if fluoridation doesn't bother you, but not the power to assume it's safe for your neighbor with kidney disease, his pregnant wife or their diabetic daughter!

About Karen: Currently a consultant working with software development teams, Karen Spencer is a former analyst and project leader. She is adept at conducting research and analyzing trends. Her special interests include critical thinking, data-driven decision making, and organizational theory. She and others in her family are among the 15% of Americans with chemical sensitivities triggered by exposure to fluoridated food and drink. Karen's most recent publications were featured in:

Medical Hypotheses (2018): <https://www.sciencedirect.com/science/article/pii/S0306987718308600>

GreenMed (2017): <http://www.greenmedinfo.com/blog/science-and-alternative-facts-about-fluoridation-false-dilemmas-and-fake-news>

CHEMISTRY LAB WORK

SHORT ANSWER: When fluoridationists try to tell you that the fluoridation chemicals “dissociates” into harmless and beneficial ions when added to water supplies, it’s not true. Some of the poison remains poison and some act synergistically with other components in the water to create new poisons.

LONG ANSWER: In 1975, Johannes Westendorf demonstrated unexpected and alarming biochemical behaviors of fluoridation chemicals in drinking water. A 1957 study published in the Journal of Dental Research coauthored by one of the leading fluoride promoters who advocated for the government 1950 endorsement of “safe and effective” confirmed that there had never been any direct testing of the chemical or biochemical effects of fluoridation under any circumstance approximating actual usage in drinking water - that everything was theoretical. A 2001 letter from Sally C. Gutierrez, Director of Water Supply and Water Resource Division at the U.S. EPA, to Dartmouth researcher, Dr. Roger Masters, verified that the biological and chemical effects of fluoridation chemicals in association with metals in water are not understood, that there are significant gaps in the science, as did the 2006 NRC. Dr. Richard Sauerheber contributed to our understanding in 2013 with a chemistry report suggesting the biological mechanisms consistent with the 2010 findings of Sawan et al. who looked at real world data that “suggest that a biological effect not

yet recognized may underlie the epidemiological association between increased BPb lead levels in children living in water-fluoridated communities.” Fluoridation chemicals added to water are poisons; they are registered and labeled as such with accompanying material data safety sheets (MSDS). Some remain poison, and some combines with available components in water (and in guts) to create new toxic exposures for consumers.



Westendorf, Johannes (1975) Doctoral thesis presented at the University of Hamburg, Germany, available in English translation. <http://www.fluoridealert.org/wp-content/uploads/westendorf.pdf>
Review: <http://fluoridealert.org/studies/westendorf-foreword/>

Feldman, I, Morkin, D, and Hodge ,HC. “The State of Fluoride in Drinking Water,” Journal of Dental Research, 36:2(1957)192-202. <http://journals.sagepub.com/doi/pdf/10.1177/00220345570360020501>

Letter from Sally C. Gutierrez, Director, Water Supply and Water Resources Division, Office of Research and Development, National Risk Management Research Laboratory, U.S. EPA, Cincinnati to Roger Masters, March 15, 2001. (*included in Review of Westendorf above*)
Masters in PubMed: https://www.ncbi.nlm.nih.gov/pubmed/?term=Masters%20RD%5BAuthor%5D&cauthor=true&cauthor_uid=11233755

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Sauerheber R. Physiologic Conditions Affect Toxicity of Ingested Industrial Fluoride. Journal of Environmental and Public Health. 2013. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3690253/>

FLUORIDATION: Rapid Transport of Toxins to the Brain

Fluoride not only easily crosses both the placental and blood-brain barriers, but also forms strong bonds with toxic metals like aluminum and lead and in so doing increases absorption of these poisons into brain and body tissue.

Fluoridation chemicals used by municipal water utilities are invariably polluted with tramp contaminants that include aluminum and lead, as well as an assortment of other poisons. Fluoride, aluminum and lead are known factors in various neurological diseases from autism and low IQ in children to Alzheimer's and Parkinson's Disease in seniors. Most of these toxins are either at 'allowable limits' or are 'not regulated' i.e. not tested for under NSF guidelines that exempts fluoridation chemicals from scrutiny. This cavalier attitude towards public health and fluoridation chemicals is necessary in order to allow fluoridation policy to continue since fluoridation chemicals are the contaminated waste product of industry, primarily aluminum and phosphate industry in the United States, China and Mexico.



"The addition of fluorides to drinking water was, and is, a mistake." - Dr. Robert Isaacson (2007)

—> **What poisons are in your city's water?** —> **What poisons are in your brain?**

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Neurological Impact of Fluoride *samples of 2018 studies*



Children	Adults
<p>DOSE RESPONSE: Further validation that prenatal doses consistent with doses in ‘optimal’ fluoridation practice lowers IQ up to 6 points on a dose-response trend line. “Our findings add to our team’s recently published report on prenatal fluoride and cognition at ages 4 and 6–12 years by suggesting that higher in utero exposure to F has an adverse impact on offspring cognitive development that can be detected earlier, in the first three years of life.” http://oem.bmj.com/content/75/Suppl_1/A10.1</p> <ul style="list-style-type: none"> • Thomas D, Sanchez B, Peterson K, et al. <i>OP V – 2 Prenatal fluoride exposure and neurobehavior among children 1–3 years of age in Mexico</i>. <i>Occup Environ Med</i>. 2018;75:A10. 	<p>ADULT BRAINS: First long term NaF animal study (10 weeks) using moderate levels of fluoride finds a number of histological changes including in parts of the brain associated with memory and learning, as well as chemical changes affecting brain function. https://www.sciencedirect.com/science/article/pii/S0045653518317508</p> <ul style="list-style-type: none"> • Pei Jiang, Gongying Li, Xueyuan Zhou, Changshui Wang, Yi Qiao, Dehua Liao, Dongmei Shi. <i>Chronic fluoride exposure induces neuronal apoptosis and impairs neurogenesis and synaptic plasticity: Role of GSK-3b/b-catenin pathway</i>. <i>Chemosphere</i>. Volume 214, January 2019, Pages 430-435. [Online ahead of print]
<p>FLUORIDE & CNS INFLAMMATION: Fluorides impact on immune system and CNS causes excitotoxicity and microglial priming for the childhood emergence of neurological diseases. https://www.ncbi.nlm.nih.gov/pubmed/29721353</p> <ul style="list-style-type: none"> • Strunecka A, Blaylock RL, Patocka J, Strunecky O. (2018) <i>Immunoexcitotoxicity as the central mechanism of etiopathology and treatment of autism spectrum disorders: A possible role of fluoride and aluminum</i>. <i>Surg Neurol Int</i>. 2018 Apr 9;9:74. 	<p>ALZHEIMER’S DISEASE: Describes impact of fluoride-induced stress and inflammation in the development of Alzheimer’s disease and demonstrates the mechanism for cell death in the progressive worsening of the disease over time. https://www.mdpi.com/1422-0067/19/12/3965</p> <ul style="list-style-type: none"> • Goschorska M, et al. <i>Potential Role of Fluoride in the Etiopathogenesis of Alzheimer’s Disease</i>. <i>Int. J. Mol. Sci</i>. 2018, 19 (12), 3965.
<p>LEARNING DISABILITIES: Study found attention deficit disorder in 200 individually tested children consistent with their prenatal exposure to fluoride on dose-response trend line with a ceiling effect. Excluded those with history of mental illness or complicating conditions such as diabetes and renal disease. https://www.sciencedirect.com/science/article/pii/S0160412018311814</p> <ul style="list-style-type: none"> • Morteza Bashash, Maelle Marchand, Howard Hu, Christine Till, Angeles Martinez-Mier, et al. <i>Prenatal fluoride exposure and attention deficit hyperactivity disorder (ADHD) symptoms in children at 6–12 years of age in Mexico City</i>. <i>Environment International</i>. Volume 121, Part 1, December 2018, Pages 658-666. 	<p>DEMENTIA: Describes the chemical mechanism by which the effectiveness of the two most popular drugs used to treat Alzheimer’s & other neurodegenerative dementia disease is reduced or blocked by fluoride induced oxidative stress. https://www.mdpi.com/1660-4601/16/1/10/htm</p> <ul style="list-style-type: none"> • Marta Goschorska, Izabela Gutowska, Irena Baranowska-Bosiacka, et al. <i>Influence of Acetylcholinesterase Inhibitors Used in Alzheimer’s Disease Treatment on the Activity of Antioxidant Enzymes and the Concentration of Glutathione in THP-1 Macrophages under Fluoride-Induced Oxidative Stress</i>. <i>Int. J. Environ. Res. Public Health</i>. 2019, 16(1), 10. [Online ahead of print]

Environmental References

“... a fluoride concentration as low as 0.5 mg F-/l can adversely affect invertebrates and fishes, safe levels below this fluoride/l concentration are recommended in order to protect freshwater animals from fluoride pollution.” - JA Camargo in “*Fluoride toxicity to aquatic organisms: a review*” (2003)

“Barium and aluminum levels approached those that the EPA found in samples of electroplating sludge, river sediment, and hazardous soils... contaminant content creates a regulatory blind spot that jeopardizes any safe use of fluoride additives.” - PJ Mullenix in “*A new perspective on metals and other contaminants in fluoridation chemicals*” (2014)

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Environmental References

WHAT WE KNOW:

1. We know that fluoride has an adverse impact on the migration, reproduction and mortality of salmon and trout even at 0.5 ppm in fresh water.
2. We know that laboratory experiments using zebra fish confirm fluoride in low concentrations such as 0.5 ppm adversely impacts the endocrine system of that animal model.
3. We know that approximately the same concentration has an adverse impact on some plants and aquatic life lower on the food chain.
4. We know that fluoride accumulates in brains of seabirds where it causes calcification.
5. We know that fluoride accumulation in human brains is associated with neurodegenerative conditions.
6. We know that industrial fluoride pollution contributes to the fluoride exposure.
7. We know that the fluorides added to tap water are fundamentally different compositions than the natural fluoride found in seawater.
8. We know that fluoridated water is harmful to many amphibians and reptiles, and consequently result in de-fluoridation of city water at zoos in order to reduce disease and mortality in these animals.
9. We know that fluoridated wastewater discharge from 'optimally' fluoridated communities at 0.7 ppm is frequently higher than 0.7 ppm due to a combination of factors.
10. We know that ~98% of fluoridation chemicals added to drinking water goes directly into wastewater.
11. We know that 100% of fluoridation chemicals are contaminated with other toxins such as aluminum, arsenic, barium, cadmium, lead, etc.
12. We know that despite the addition of buffering chemicals to counteract the corrosive nature of fluoridation chemicals, municipal water infrastructure in fluoridated communities has an accelerated deterioration with a net result of more chemicals and toxic metals in waste water.
13. We know that fluoride and assorted toxins accumulate in silt and anticipate fluoride can persist for a million years or more.
14. We know that smog results in ocean pollution that bleaches coral via the same type of poisoning that happens to developing teeth known as dental fluorosis. DF mottles the teeth of over half of U.S. teens. Our fluoridation chemicals are harvested from air pollution control systems in Shanghai, China - packaged air pollution.
15. We know that fluoride is an enzyme poison and an EPA contaminant identified as a developmental neurotoxicant.
 - Until the mid 1980s, 2.4 ppm was the EPA maximum contaminant level goal (MCLG) for fluoride in drinking water. The actionable maximum contaminant level (MCL) was set at the same concentration. The MCL/MCLG was increased to 4 ppm at the behest of lobbyists for polluters and municipalities who could not afford to take steps to de-fluoridate their contaminated water. The 4 ppm MCL/MCLG was objected to by EPA scientists, but was given a provisional pass by the 1993 NRC pending research that still hasn't been done. The 2006 NRC advised that 4 ppm was not protective of human health and that the gaps in knowledge make it impossible to determine a scientifically defensible reference dose for fluoride in drinking water, but there has been no EPA action to reduce the MCL/MCLG determined as harmful.
 - The Safe Drinking Water Act calls for reviews of MCLs every six years to guarantee safety.

WHAT WE DO NOT YET KNOW:

- A. We do not yet know the long term impact of fluoridated wastewater on fresh water plants and fisheries.
- B. We do not yet know the long term impact of fluoridated wastewater on salt water plants and fisheries.
- C. We do not yet know the impact of fluoridated waste water on seabirds or plankton.
- D. We do not yet know the impact of overall fluoride pollution on ocean mammals' health, migration or reproduction.
- E. We will likely never know how to clean the fluoride out of wetlands and waters contaminated with fluoridation chemicals.

Gloucester was founded almost 400 years ago and incorporated almost 150 years ago.
Native Americans lived and fished on Cape Ann for at least another 500 years prior to our arrival.
"Build not for today alone, but for tomorrow as well."
Think long term.





\$ Thousands \$ in cosmetic dentistry

2018 “There was a difference of 31.6% in dental fluorosis prevalence between 2012-2011 when compared to data from 2002-2001 in adolescents aged 16 and 17 years. The continued increase in fluorosis rates in the U.S. indicates that additional measures need to be implemented to reduce its prevalence.”

SOURCE: Wiener RC, et al. (2018). Dental Fluorosis over Time: A comparison of National Health and Nutrition Examination Survey data from 2001-2002 and 2011-2012. J Dent Hygiene. 92 no. 1 23-29

2010 “The prevalence of very mild fluorosis increased from 17.2% to 28.5% and mild fluorosis increased from 4.1% to 8.6%. The prevalence of moderate and severe fluorosis increased from 1.3% to 3.6%”

SOURCE: Beltrán-Aguilar ED, Barker L, Dye BA. (2010) Prevalence and Severity of Dental Fluorosis in the United States, 1999–2004. NCHS Data Brief. No. 53

1990: “There is a growing body of evidence which indicates that the prevalence and, in some cases, the severity of dental fluorosis is increasing in both fluoridated and non-fluoridated regions in the U.S... This trend is undesirable for several reasons:

1. It increases the risk of esthetically objectionable enamel defects;
2. in more severe cases, it increases the risk of harmful effects to dental function;
3. it places dental professionals at an increased risk of litigation; and
4. it jeopardizes the perception of the safety and, therefore, the public acceptance of the use of fluorides.”

SOURCE: Whitford GM. (1990). The physiological and toxicological characteristics of fluoride. Journal of Dental Research 69 (Special Issue):539-49.

Dental fluorosis among American adolescents

1945: $\leq 3\%$

1986-1987: 22% with 1% moderate-severe

1999-2004: 41% with 4% moderate-severe

2011-2012: 61% with 23% moderate-severe



NORMAL



MILD



MODERATE



SEVERE

* Dental Fluorosis costs the individual thousands, the community millions and fuels the multi-billion dollar cosmetic dentistry industry.

Series of Studies - A Selection Suggesting Institutional Bias

The Public Health Service and CDC has known since the 1950s that fluoride both saturates the placenta and passes into amniotic fluid and the fetal blood stream. This has been noted repeatedly in government documents. See 2003 CDC ATSDR ([Section 1.6](#)). However, exploration of the implications of those medical facts has been slow in surfacing. As of this writing in Jan 2018, there are literally hundreds of studies with findings that the implications of prenatal fluoride exposure include a number of ill effects, including:

1. Increased risk of preeclampsia
2. Increased risk of pre-term birth
3. Increased risk of slightly lowered IQ in offspring
4. Increased risk of learning disabilities and mood disorders in offspring
5. Increased risk of allergies and autoimmune disease in offspring.

In 2009 and 2015, EPA scientists (Mundy et al.) confirmed that fluoride is a 'gold standard developmental neurotoxicant' - a brain poison when exposure is during critical phases of brain development. In 2017, the findings of a longitudinal NIH/NIEHS/EPA sponsored study found that in doses consistent with doses in healthy adults living in 'optimally' fluoridated communities, prenatal exposure to fluoride as determined by maternal urine results in up to a 6 point drop in IQ on a dose-response trend line (Bashash et al. 2017). The findings of this rigorous study validate the findings of hundreds of other modern neurotoxicity studies.

Attached are four studies (w/highlights), one modern and three historical, that in themselves confirm that fluoridation is neither effective nor safe for young children and pregnant women.

1. The Association of Early Childhood Caries and Race/Ethnicity among California Preschool Children. Shiboski CH, Gansky SA, Gomez FR, Pollick H. *Journal of Public Health Dentistry*. February 2003; 63(1): 38-46.
 - This large study on the pattern of cavities in Head Start children based on ethnicity mentioned several times that fluoridation made no impact on cavities. In other words, the claim that fluoridation 'helps the poor children' is false. I have much more on that.
2. Gardner DE, Smith FA, Hodge HC, Overton DE, Feltman R. The fluoride concentration of placental tissue as related to fluoride content in drinking water. *Science*. February 1952; 115(2982):208-209.
 - This post hoc study is what passed as a 'safety study.' One of the authors, Hodge, was the leading proponent of fluoridation, converting the danger threshold of 1 ppm to the 'optimal' level and moving the danger threshold to 2.4 ppm. This study found fluoride concentration in the placentas of women consuming 1 ppm fluoridated water was above 2 ppm, acknowledged they had no way to determine the fetal fluoride level, but cavalierly opined the fluoride saturated placenta posed no danger to the mother.
3. Prenatal and postnatal ingestion of fluorides - A Progress Report. Reuben Feltman, D.D.S. *Dental Digest*. August 1956. pp 353-357.
 - The best study done in that time period, the researchers determined the allergic population has a low tolerance that manifested as serious adverse effects in their test subjects. PHS researchers had to drop those test subjects and advised if in water, fluoride avoidance would be difficult. Researchers used controlled doses equivalent to fluoridated water and confirmed with placebo, it was the fluoride.
 - Case 3 closely describes my experience in 1981 beginning the week Gloucester began fluoridation during my 2nd pregnancy.
4. Prenatal and postnatal ingestion of fluorides - Fourteen years of investigation - Final report. Reuben Feltman, D.D.S. & George Kosel, B.S., M.S. *Journal of Dental Medicine*. October 1961; 16(4):190-198.
 - This final report noted that fetal fluoride levels were approximately twice, tripled and quadrupled the control group dependent on type of fluoride used in the controlled dose. Researchers had no idea what the long term implications could be in the children (12.9 mcg/L v. 26.85, 32.68, and 44.8 mcg/L).
 - Feltman & Kosel also unexpectedly noted moderate-severe dental fluorosis which is evidence of fluoride poisoning as well as delayed tooth eruption they suspected was due to thyroid suppression.
 - The PHS pulled further research funding with the statement, they 'considered fluoridation settled.'

submitted by,
Karen Spencer
29 January, 2018

Public Hearing Presentation References: October 9, 2018

International Academy of Oral Medicine and Toxicology (IAOMT) Position Paper against Fluoride Use in Water, Dental Materials, and Other Products for Dental and Medical Practitioners, Dental and Medical Students, Consumers, and Policy Makers. David Kennedy; Amanda Just; John Kall,; Griffin Cole. September 22, 2017.

Pregnancy and Fluoride Do Not Mix. John D. MacArthur. [CreateSpace](#). 2016

Source: Wiener RC, et al. (2018) *Dental Fluorosis over Time: A comparison of National Health and Nutrition Examination Survey data from 2001-2002 and 2011-2012*. J Dent Hygiene.

Source: ndoti Mavindu, et al. (2018) *Oral Hygiene Habits and Dental Treatment Needs of Children with Dental Fluorosis and Those Without Dental Fluorosis age 12-15 years in a High Fluoride Area in North Kiajiado Kenya*. Mod. Approach to Dental Oral Hygiene.

Source: Jiménez-Córdova MI, et al. (2018) *Evaluation of kidney injury biomarkers in an adult Mexican population environmentally exposed to fluoride and low arsenic levels*. Toxicology and Applied Pharmacology.

Source: Perera T, et al. (2018) *Effect of fluoride on major organs with the different time of exposure in rats*. Environmental Health and Preventive Medicine.

Source: Fluegge K. (2016) *Community water fluoridation predicts increase in age-adjusted incidence and prevalence of diabetes in 22 states from 2005 and 2010*. Journal of Water and Health.

Source: Chaker, et al. (2018) *Thyroid Function and Risk of Type 2 Diabetes: A Population-Based Prospective Cohort Study*. BMC Medicine.

Source: Kheradpisheh Z, et al. (2018) *Impact of Drinking Water Fluoride on Human Thyroid Hormones: A Case- Control Study*. Scientific Reports.

Source: Khandare AL, et al. (2018) *Role of Carbonic Anhydrase and Triiodothyronine in Dental Caries Affected Children in Fluorosis Endemic Areas*. Advances in Dentistry and Oral Health.

Source: Chaitanya NCSK, et al. (2018) *A systematic analysis on possibility of water fluoridation causing hypothyroidism*. Indian J Dent Res.

Source: Yung-gan L, et al. (2016) *Fluorosis increases the risk of postmenopausal osteoporosis by stimulating interferon γ* . Biochemical and Biophysical Research Communications.

Source: Kakei M, et al. (2016) *Fluoride Exposure May Accelerate the Osteoporotic Change in Postmenopausal Women: Animal Model of Fluoride-induced Osteoporosis*. Adv Tech Biol Med.

Source: Levy SM, et al. (2018) *Associations of fluoride intake with children's cortical bone mineral and strength measures at age 11*. J Public Health Dent.

Source: Abdullatef N, et al. (2016) *Immuno Histochemical Study of Osteosarcoma Using Ki-67 as a Labeling Index in Naturally Fluoridated Community*. Adv Dent & Oral Health.

Source: Gesser-Edelsburg A, Shir-Raz Y. (2016) *Communicating risk for issues that involve 'uncertainty bias': what can the Israeli case of water fluoridation teach us?* Journal of Risk Research.

Source: Spencer K. (2017) *Science and Alternative Facts: About fluoridation, false dilemmas and fake news*. GreenMedInfo.com. Rpt. in Masters of Health. February 2018.

Source: Sanders AE, Slade GD. (2017) *Blood Lead Levels and Dental Caries in U.S. Children Who Do Not Drink Tap Water*. American Journal of Preventive Medicine.

View presentation: <https://www.youtube.com/watch?v=Ld2waQrq-qc>

K Spencer

Public Hearing Presentation References: October 9, 2018

Source: Slade GD, Grider WB, Maas WR, Sanders AE. (2018) *Water Fluoridation and Dental Caries in U.S. Children and Adolescents*. Journal of Dental Research.

Source: Bashash M, Thomas D, Hu H, et al. (2017) *Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6–12 Years of Age in Mexico*. Environ Health Perspect.

Source: “Fluoride Exposure in Utero Linked to Lower IQ in Kids.” Fluoride Action Network. October 2017.

Source: Thomas D, Sanchez B, Peterson K, et al. (2018) *OP V – 2 Prenatal fluoride exposure and neurobehavior among children 1–3 years of age in Mexico Occup*. Environ Med.

Source: Yu X, et al. (2018) *Threshold effects of moderately excessive fluoride exposure on children's health: A potential association between dental fluorosis and loss of excellent intelligence*. Environ Int.

Source: Kostev K, Hadji P, Jacob L. (2018) *Impact of Osteoporosis on the Risk of Dementia in Almost 60,000 Patients Followed in General Practices in Germany*. Journal of Alzheimer's Disease,

Source: Rajendran K, et al. (2016) *A Case of Interosseous Membrane Calcification*. J of Clinical and Diagnostic Res.

Source: Jiang X, et al. (2018) *RAGE and its emerging role in the pathogenesis of Parkinson's disease*. Neuroscience Letters.

Source: Gandhi D, et al. (2017) *Fluoride-Induced Oxidative and Inflammatory Stress in Osteosarcoma Cells: Does It Affect Bone Development Pathway?* Biol Trace Elem Res.

Source: Campos-Pereira FD, et al. (2017) *Genotoxic effect and rat hepatocyte death occurred after oxidative stress induction and antioxidant gene downregulation caused by long term fluoride exposure*. Chem Biol Interact.

OCTOBER STUDIES NOT FEATURED

Romero et al. 2017

- Ashley J. Malin, Julia Riddell, Hugh McCague, Christine Till. *Fluoride exposure and thyroid function among adults living in Canada: Effect modification by iodine status*. Environment International. Volume 121, Part 1, December 2018, Pages 667-674.
- Christine Till, Rivka Green, John G. Grundy, Richard Hornung, Raichel Neufeld, E. Angeles Martinez-Mier, Pierre Ayotte, Gina Muckle, and Bruce Lanphear. *Community Water Fluoridation and Urinary Fluoride Concentrations in a National Sample of Pregnant Women in Canada*. Environmental Health Perspectives. 2018.
- Morteza Bashash, Maelle Marchand, Howard Hu, Christine Till, Angeles Martinez-Mier, Brisa N. Sanchez, Niladri Basu, Karen Peterson, Rivka Green, Lourdes Schnaas, Adriana Mercado-García, Mauricio Hernández-Avila, Martha María Téllez-Rojo. *Prenatal fluoride exposure and attention deficit hyperactivity disorder (ADHD) symptoms in children at 6–12 years of age in Mexico City*. Environment International. Volume 121, Part 1, December 2018, Pages 658-666.
- Claudia X Harriehausen, Fehmida Z Dosani, Brett T Chiquet, Michelle S Barratt, and Ryan L Quock. *Fluoride Intake of Infants from Formula*. Journal of Clinical Pediatric Dentistry. 2018.
- Karen Favazza Spencer, Hardy Limeback. *Blood is Thicker Than Water: Flaws in a National Toxicology Program Study*. Medical Hypotheses. Volume 121. December 2018. Pages 160-163.
- P. Sudheer Shenoya, Utsav Sena, Saketh Kapoor, Anu V. Ranade, Chitta R. Chowdhury, Bipasha Bose. *Sodium fluoride induced skeletal muscle changes: Degradation of proteins and signaling mechanism*. Environmental Pollution. Available online 10 October 2018.

View presentation: <https://www.youtube.com/watch?v=Ld2waQrq-qc>

K Spencer

Who benefits from fluoridation?

The Profiteers:

- 1. Pharma** who not only market fluoridated toothpastes and dental treatments, but also fluoridates many drugs and has an interest in maintaining a positive image for fluoride
 - Fluoride is a cheap intensifier that saves Pharma money.
 - [Baycol](#) and [Fen-Phen](#) are just two of the infamous recalled fluoridated drugs
 - [Fluoroquinolone antibiotics](#) have black box warnings.
- 2. Sugar industry** who corrupted NIDR & NIH to focus on the [magic potion narrative](#) instead of recommending less sweets. Have you seen the [Crest Halloween commercial](#) that airs every October?
- 3. Dentists** earn considerably more on cosmetic dentistry for adults with dental fluorosis than childhood cavities. Fluoride treatments are another money maker. Google before and after dental fluorosis. Honest dentists readily admit to this. We provided you with the personal & professional testimony of MA dentist, Dr. Evans, as well as emails from leading dentists.
 - Dentists make more money in fluoridated communities, first reported in: The Journal of the American Dental Association, Vol. 84, Feb. 1972
 - The ADA is a trade association and the [dental lobby's clout](#) rivals the gun lobby's.
- 5. Businesses** tangential to fluoridation process which include distribution, equipment and additional pH balancing chemicals. Fluoride also has many industrial uses involving non-stick surfaces, textiles, fracking, etc.
- 6. Fluoridation promotion** is very profitable. Hundreds of millions are spent on marketing materials and astroturf initiatives
 - The ADA and other promoters are also concerned about liability from years of promotion
 - Think Tobacco and Asbestos lawsuits
 - Even government agencies like the Dept of Health & Human Services profits. I am given to understand that their annual budget for fluoridation promotion is in excess of a hundred million dollars a year. I believe that includes the budget for the small team in the Oral Health Division of the CDC. (see attached)
- 7. Vendors** & other polluters for whom safe disposal is costly with liability issues attached
 - Fluoride polluters. See [Mosaic in Florida](#) the leading US provider of fluoridation water additives. However, Gloucester gets its fluoride from Shanghai, China - packaged "Shanghai Smog."
 - The high EPA fluoride MCL and false image of fluoride as a miracle mineral benefits many industrial polluters.

Poisoned Apple

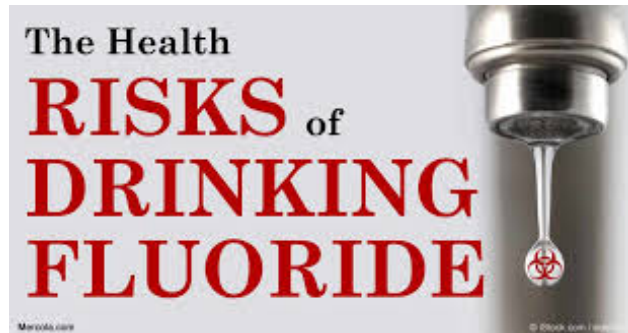


Neurobehavioral

A rigorous NIH study confirmed the dozens of studies since 1995, that prenatal consumption of low doses of fluoride causes subtle damage to developing brains.

Carcinogenicity

The NRC panel agreed that fluoride appears to “initiate or promote cancers.” All foods grown or prepared with fluoridated water absorb fluoride.



Enzyme Inhibition

Scientists have known that fluoride is an enzyme poison for over a hundred years. The question becomes one of tolerance and dosage. Diabetics and others who consume more water and kidney patients who cannot excrete fluoride as effectively will carry a heavier toxic load of fluoride in their bodies and bones. Moreover, fluoride interferes with glucose metabolism and calcium metabolism. It also causes abnormal bone metabolism, the visible evidence is a permanent condition called dental fluorosis. Dental fluorosis makes teeth more brittle resulting in increased cosmetic dentistry later in life. Corrosive and reactive fluoridation chemicals also increase lead levels in bones, blood and brains because of tramp contamination, biochemistry, and chemical interaction with plumbing.

FluorideAlert.org & MomsAgainstFluoridation.com

Legal References

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 - Cross D. An Unhealthy Obsession with Fluoride. Nanotechnology Perceptions. 11(3):169. November 2015.
 - Legal Arguments Against Artificial Water Fluoridation by Nader R. Hasan, JD with attached Affidavit on Health Effects by Kathleen Theissen, PhD, member of the 2006 US National Research Council panel on Fluoride in Drinking Water. June 23, 2014.
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 - Letter to National Governors Association from consumer advocate Erin Brockovich, et al. April 27, 2016.
- “The cessation of all compulsory water fluoridation schemes should be the goal of all public health agencies, ethical lawmakers, and informed citizens.”
- Prof. Rita Barnett-Rose, JD (2014)

Rethinking Fluoride

It's Time to Change!



“...for decades we have believed that fluoride in small doses has no adverse effects on health... But more and more scientists are now seriously questioning the benefits of fluoride, even in small amounts.”

UNICEF - A United Nations Organization

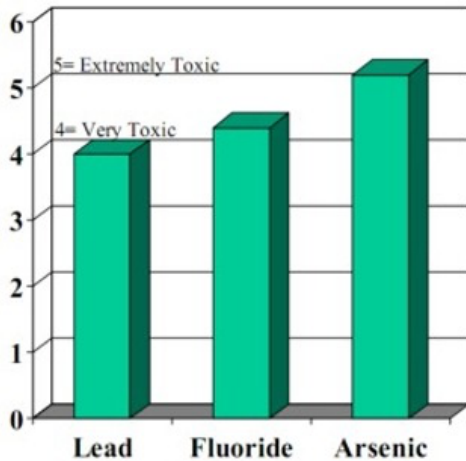
Fluoridation policy is a medical mandate decided at state and municipal levels that is willfully blind to the adverse impact on the 15-30% of consumers for whom fluoride consumption is medically contraindicated as well as to the environmental implications of contaminated wastewater.
(July 2018)

Inflammation

Fluoride, even in low concentrations, is an inflammatory drug. Skin rashes, gastrointestinal distress, and pain are among the earliest signs of fluoride sensitivity.

Immunology

The 2006 NRC wrote, “There is no question that fluoride can affect the cells involved in providing immune responses.” Science over the past decade agrees.



Endocrine Disruption

The 2006 National Research Council panel found the evidence of endocrine disruption to be among the most compelling of the many adverse health impacts they documented in their report to the EPA on *Fluoride in Drinking Water*. The NRC noted there were significant gaps in the research making it impossible to identify the Lowest Observable Adverse Effect Level (LOAEL). Gaps included examining the impact of chronic low dose exposure on vulnerable groups such as pregnant women and their fetuses, bottle fed babies and young children, the elderly and those with prolonged illness. See sampling of the many studies that address that gap.

Health References

- Morteza Bashash, Deena Thomas, Howard Hu, et al. Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6–12 Years of Age in Mexico. *Environ Health Perspect*. Sept 2017. Vol 125, Issue 9.
- Fluoride: a risk factor for inflammatory bowel disease? Follin-Arbelet B, Moum B. *Scand J Gastroenterol*. 2016 May 19:1-6.
- Are fluoride levels in drinking water associated with hypothyroidism prevalence in England? A large observational study of GP practice data and fluoride levels in drinking water. S. Peckham et al. *J Epidemiol Community Health*. 24 February 2015.
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- Mitsuo Kakei, et al. Fluoride Exposure May Accelerate the Osteoporotic Change in Postmenopausal Women. *Adv Tech Biol Med* 2016, 4:1

“Fluorides make the germs in the mouth sick, and they’ll make the kid sick, too.”
Dr. David Kennedy, DDS, MPH and past president of IAOMT (2016)

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- Sicca, Claudio et al. Prevention of Dental Caries: A Review of Effective Treatments. *Journal of Clinical and Experimental Dentistry* 8.5. Dec. 2016.
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“The available data, responsibly interpreted, indicate little or no beneficial effect of water fluoridation on oral health.”
Dr. Kathleen Thiessen, 2006 National Research Council panelist (2011)

Jan 8, 2019

Dear Mayor Holder and Council members,

Windsor City Council failed to consider the core concern when they recently voted to resume artificial fluoridation: Might the delivery agent, hydrofluorosilicic acid, trigger unintended health consequences?

If the answer were known, one would think Health Canada would have it. But, no.

On May 26, 2014, the nation's leading health advocacy responded to an inquiry filed through the Access to Information Act. It was asked to identify all "reports, studies, toxicology and clinical tests relating to hydrofluorosilicic acid in Canadian tap water."

Health Canada's answer: "After a thorough search for the requested information, no records were located which respond to your request."

No "double-blind study done by Canada or any province showing dental efficacy and human safety." No such study from "anywhere in the world." (attached)

Nevertheless, having heard the Windsor-Essex County Health Unit vouch for its safety, we are on the verge of witnessing the reintroduction of this untested chemical agent to drinking water used by Windsor, LaSalle and Tecumseh.

Let those words sink in – untested chemical agent, and *drinking water*. So much for the Health Unit's celebrated adherence to scientific discipline.

Disturbingly, the Ontario Ministry of Health's Public Health Branch has known for 20 years that artificial fluoridation is an unnecessary risk. It commissioned a review on the benefits and risks of water fluoridation that states, "*Canadian studies do not provide systematic evidence that water fluoridation is effective in reducing decay in contemporary child populations. The few studies of communities where fluoridation has been withdrawn do not suggest significant increases in dental caries as a result.*"

<http://www.health.gov.on.ca/en/common/ministry/publications/reports/fluoridation/fluoridation.aspx>

There is no controversy that fluoride comes from a variety of sources and no one, in history has ever been diagnosed as having a fluoride deficiency.

And nobody disputes that fluoride's toxicity is rated higher than lead.

An obstetrician informed me decades ago that about half of all fluoride consumed is stored in the body and he advised me to avoid fluoridated products. But how do you avoid fluoridated water? And whose advice should I follow. A doctor who has assessed me and knows my family history or a doctor who incredibly, is willing to prescribe a hazardous waste product void of any regulated therapeutic nutrients?

Promoters of artificial fluoridation recklessly say dilution will somehow make it safe to ingest. Don't grains of sand eventually make a beach?

And what of the arsenic that is found in every batch of HFSA? A 2014 cost-benefit analysis in the journal Environmental Science & Policy concluded the U.S. would save \$1 billion to \$5 billion annually in cancer treatment costs if artificial fluoridation was achieved using a less toxic, sodium fluoride. https://hero.epa.gov/hero/index.cfm/reference/details/reference_id/1704093

The downside? Sodium fluoride is 12 times the cost of HFSA.

And don't forget, 98% of it all goes down the drain without ever passing over our teeth and gums. Meanwhile, arsenic, like fluoride is a developmental neurotoxin and several newly published studies are associating fluoridation with Alzheimer's, ADHD and autism (attached). All three of these issues are increasing at alarming rates. Is it sound public policy to ignore these trends and focus rather on the possible ½ a cavity difference that artificial fluoridation is supposed to save?

The Globe and Mail recently reported little difference between cavity rates in Ontario compared to Quebec where fluoridation is almost non-existent. <https://www.theglobeandmail.com/life/health-and-fitness/fluoridation-may-not-do-much-for-cavities/article4315206/> Health Canada however, down played the significance of the findings.

"While accurate," the data on the children are "an incomplete picture of the tooth decay situation... [and] cannot be used to form conclusions regarding the efficacy of fluoride use in water," Health Canada said. This is ironic given the fact it is exactly what our Windsor Health Unit is doing. They've chosen to ignore the fact that increasing trends of urgent care began before fluoridation stopped here. They ignore variables that have direct impact on oral health like our increasing rates of immigration, methamphetamine use and the fact that Windsor now has the highest rate of children living in low-income households. The 2018 Health Report provided no evidence at all that our fluoridation status had any effect on their data. (attached)

Cochran, a trusted global independent network of researchers, conducted a systematic review on artificial fluoridation in 2015. It concluded there was insufficient evidence to attribute caries levels to fluoridation, based on socioeconomic status. And the U.S. EPA Headquarters Union of Scientists (about 1500 of them) have declared fluoridation, a vehicle for disseminating a toxic and "prophylactically useless" substance, wrong at any rate of dilution.

Decision-makers need to remember, we aren't taking fluoride away from those who want it. Topical application of fluoride is the most effective means of delivering fluoride. But for those who still believe they require fluoride in their saliva, drinking tea, non-organic grape juice or brushing with dollar-store fluoridated toothpaste are all cheap ways to increase salivary fluoride levels. <https://www.myfooddata.com/articles/high-fluoride-foods-and-drinks.php>

For those who believe artificial fluoridation is a social justice issue, they could not be more wrong. Artificial fluoridation poses risk to those who are most vulnerable – the developing fetus, infants fed reconstituted formula, residents with compromised immune systems, or impaired thyroid and kidney function.

Currently, there are 22 million Canadians – about 70% – that have rejected artificial water fluoridation. Advocates for safe water are clearly not the minority.

Now more than ever, stopping fluoridation is the most fiscally, ethically and scientifically responsible thing to do.

Respectfully,

Donna Jean Mayne

Fluoride-Free Windsor Essex

Access to Information and Privacy Division
7th Floor, Suite 700, Holland Cross, Tower B
1600 Scott Street
Address Locator: 3107A
Ottawa, Ontario K1A 0K9

Our file: A-2014-00168 / na

May 26, 2014

Joanne David
<address snipped>
EDMONTON AB T6R 0B4

Dear Ms. David:

This is in response to your request under the *Access to Information Act* (the *Act*) for: **Clarified Request Text:**
Reports, studies, toxicology and clinical tests relating to hydrofluosilicic acid in Canadian tap water

Original Request Text:

Documents pertaining specifically to hydrofluosilicic acid in Alberta and Canadian tap water:

- Studies from 1940 showing dental efficacy and human safety.
- Studies from 1950s showing dental efficacy and human safety.
- Any double blind study done by Canada or any province showing dental efficacy and human safety, of any date.
- Any double blind study done by anywhere in the world that was considered.
- Any toxicity study, of any date, done by Canada or the world that was considered.
- Evidence of any kind (not opinion) that shows statistical viability of water fluoridation in terms of efficacy, and margin of error calculations.
- Evidence of any kind (not opinion) that shows statistical viability of water fluoridation in terms of human safety over a life-time, and margin of error calculations.
- Evidence of any kind (not opinion) that shows statistical viability of water fluoridation in terms of human safety, and margin of error calculations, for infants, young children, elderly, or any adult with disability, diabetes, bone disease, autism, thyroid ailments, kidney disease, etc.
- Evidence of any kind of consideration of human rights and medical ethics, namely our human right to opt out of the forced water fluoridation program, and if that consideration exists, why the overriding of these well-established medical standards are breached.

After a thorough search for the requested information, no records were located which respond to your request.

If you have any questions or concerns about the processing of your request, please do not hesitate to contact Nancy Armstrong, the analyst responsible for this request, either by phone at (613) 960-4457, or by fax at (613) 941-4541, or by e-mail at nancy.armstrong@hc-sc.gc.ca with reference to the file number cited above.

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Study: Fluoride levels in pregnant women in Canada show drinking water is primary source of exposure to fluoride

October 10, 2018 Faculty of Health, fluoride, media news release



TORONTO, October 10, 2018 – A new study

The levels of fluoride among pregnant women living in fluoridated communities in Canada were similar with in urine are twice as high as those of pregnant women living in non-fluoridated communities. The levels of fluoride in urine are twice as high as those of pregnant women living in Mexico City where fluoride is added to table salt. levels reported in a prior study of pregnant women living in Mexico City where fluoride is added to table salt.

“This finding is concerning because prenatal exposure to fluoride in the Mexican sample has been associated with lower IQ in children. New evidence published today in *Environment International* also reported an association between higher levels of fluoride in pregnancy and inattentive behaviours among children in the same Mexican sample,” said Till.

“We found that fluoride in drinking water was the major source of exposure for pregnant women living in Canada. Women living in fluoridated communities have two times the amount of fluoride in their urine as women living in non-fluoridated communities,” said Christine Till, an associate professor of Psychology in York’s Faculty of Health and lead author on the study.

The Maternal Infant Research on Environmental Chemicals (MIREC) study recruited 2,001 pregnant women between 2008 and 2011. The women lived in 10 large cities across Canada. Seven of the cities (Toronto, Hamilton, Ottawa, Sudbury, Halifax, Edmonton and Winnipeg) added fluoride to municipal water while three (Vancouver, Montreal and Kingston) did not.



Neurological Impact of Fluoride
samples of 2018 studies



Children	Adults
<p>DOSE RESPONSE: Further validation that prenatal doses consistent with doses in 'optimal' fluoridation practice lowers IQ up to 6 points on a dose-response trend line. "Our findings add to our team's recently published report on prenatal fluoride and cognition at ages 4 and 6–12 years by suggesting that higher in utero exposure to F has an adverse impact on offspring cognitive development that can be detected earlier, in the first three years of life." http://oem.bmj.com/content/75/Suppl_1/A10.1</p> <ul style="list-style-type: none"> Thomas D, Sanchez B, Peterson K, et al. <i>OP V – 2 Prenatal fluoride exposure and neurobehavior among children 1–3 years of age in Mexico</i>. <i>Occup Environ Med</i>. 2018;75:A10. 	<p>ADULT BRAINS: First long term NaF animal study (10 weeks) using moderate levels of fluoride finds a number of histological changes including in parts of the brain associated with memory and learning, as well as chemical changes affecting brain function. https://www.sciencedirect.com/science/article/pii/S0045653518317508</p> <ul style="list-style-type: none"> Pei Jiang, Gongying Li, Xueyuan Zhou, Changshui Wang, Yi Qiao, Dehua Liao, Dongmei Shi. <i>Chronic fluoride exposure induces neuronal apoptosis and impairs neurogenesis and synaptic plasticity: Role of GSK-3β/b-catenin pathway</i>. <i>Chemosphere</i>. Volume 214, January 2019, Pages 430-435. [Online ahead of print]
<p>FLUORIDE & CNS INFLAMMATION: Fluorides impact on immune system and CNS causes excitotoxicity and microglial priming for the childhood emergence of neurological diseases. https://www.ncbi.nlm.nih.gov/pubmed/29721353</p> <ul style="list-style-type: none"> Strunecka A, Blaylock RL, Patocka J, Strunecky O. (2018) <i>Immunoexcitotoxicity as the central mechanism of etiopathology and treatment of autism spectrum disorders: A possible role of fluoride and aluminum</i>. <i>Surg Neurol Int</i>. 2018 Apr 9;9:74. 	<p>ALZHEIMER'S DISEASE: Describes impact of fluoride-induced stress and inflammation in the development of Alzheimer's disease and demonstrates the mechanism for cell death in the progressive worsening of the disease over time. https://www.mdpi.com/1422-0067/19/12/3965</p> <ul style="list-style-type: none"> Goschorska M, et al. <i>Potential Role of Fluoride in the Etiopathogenesis of Alzheimer's Disease</i>. <i>Int. J. Mol. Sci</i>. 2018, 19 (12), 3965.
<p>LEARNING DISABILITIES: Study found attention deficit disorder in 200 individually tested children consistent with their prenatal exposure to fluoride on dose-response trend line with a ceiling effect. Excluded those with history of mental illness or complicating conditions such as diabetes and renal disease. https://www.sciencedirect.com/science/article/pii/S0160412018311814</p> <ul style="list-style-type: none"> Morteza Bashash, Maelle Marchand, Howard Hu, Christine Till, Angeles Martinez-Mier, et al. <i>Prenatal fluoride exposure and attention deficit hyperactivity disorder (ADHD) symptoms in children at 6–12 years of age in Mexico City</i>. <i>Environment International</i>. Volume 121, Part 1, December 2018, Pages 658-666. 	<p>DEMENTIA: Describes the chemical mechanism by which the effectiveness of the two most popular drugs used to treat Alzheimer's & other neurodegenerative dementia disease is reduced or blocked by fluoride induced oxidative stress. https://www.mdpi.com/1660-4601/16/1/10/htm</p> <ul style="list-style-type: none"> Marta Goschorska, Izabela Gutowska, Irena Baranowska-Bosiacka, et al. <i>Influence of Acetylcholinesterase Inhibitors Used in Alzheimer's Disease Treatment on the Activity of Antioxidant Enzymes and the Concentration of Glutathione in THP-1 Macrophages under Fluoride-Induced Oxidative Stress</i>. <i>Int. J. Environ. Res. Public Health</i>. 2019, 16(1), 10. [Online ahead of print]

Dec 26, 2018

"The Windsor-Essex County Health Unit rose to infamy in 2006 when its inspectors poured bleach on egg salad sandwiches sold by little old ladies at Art in the Park. The sandwiches violated regulations because the women – raising money for Willistead Manor – boiled the eggs at home....Five months later, inspectors went after the Downtown Smoke Shop because it had a carving of an Indian holding what "appears to be" cigars, which promotes tobacco use. The public health body banned kibbeh, the traditional Lebanese dish made from raw ground beef, in restaurants here in 2012 – even though there had been no documented problem with the popular food in Ontario and the government hadn't banned it."

<https://windsorstar.com/columnists/rein-in-these-people>

But they refuse to acknowledge thousands of studies demonstrating potential harm caused by fluoride's bio-accumulative and neurotoxic effects?

Windsor has highest rate in Canada of children living in low-income households

SHARON HILL, WINDSOR STAR Updated: September 20, 2017



The Windsor area has the highest rate of children growing up in low-income families in Canada.



Almost one in four children under age 17 — or 24 per cent — are living in a low-income household in the Windsor census metropolitan area which includes Tecumseh, Lakeshore, LaSalle and Amherstburg.



The Windsor area had previously been in the top 10 but jumped to the No. 1 spot, the worst in the country, when compared to other urban areas in 2015 data released by Statistics Canada last week.



"I think we should be appalled," United Way/Centraide Windsor-Essex County CEO Lorraine Goddard said Monday. "It just should not happen in our country. We should not accept that it's happening in our community."

Canadian cities with highest rates of children living in low-income households in 2015

1. Windsor: 24 %
 2. Saint John, N.B.: 23.1 %
 3. London, Ont.: 22.2 %
 4. Winnipeg: 21.5 %
 5. St. Catharines–Niagara: 20.6 %
 6. Belleville: 20.5 %
 7. Moncton, N.B.: 20.3 %
 8. Thunder Bay: 19.9 %
 9. Toronto: 19.7 %
 10. Peterborough: 19.4 %
- Source: Statistics Canada

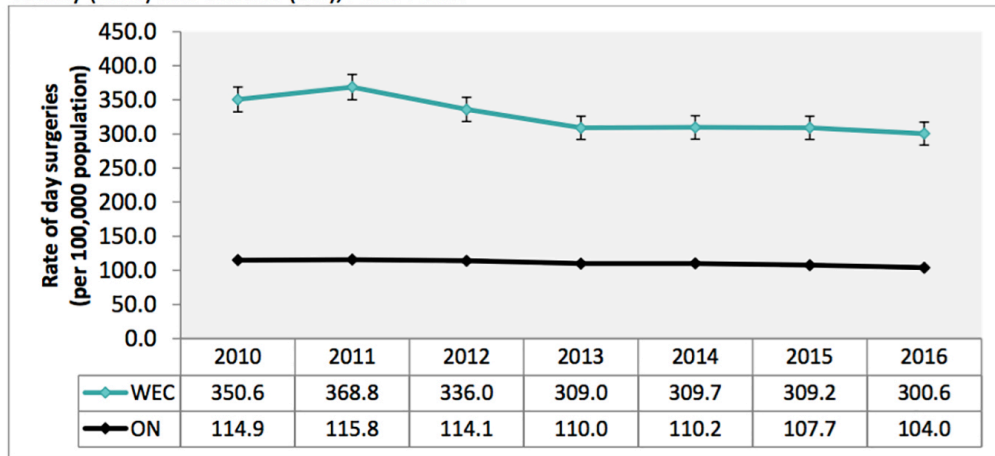
It goes along with last week's bad news that showed Windsor had the largest drop, at 6.4 per cent, in the last decade in median income among Ontario metropolitan areas.

WECHU 2018 Oral Health report failed to account for co-founding variables effecting oral health such as:

- Income status
- Immigration status
- Substance abuse
- Aging population

This is NOT "evidence based science."

Figure 8. The rate of day surgeries for oral health (caries-related) issues in Windsor-Essex County (WEC) and Ontario (ON), 2010-2016.

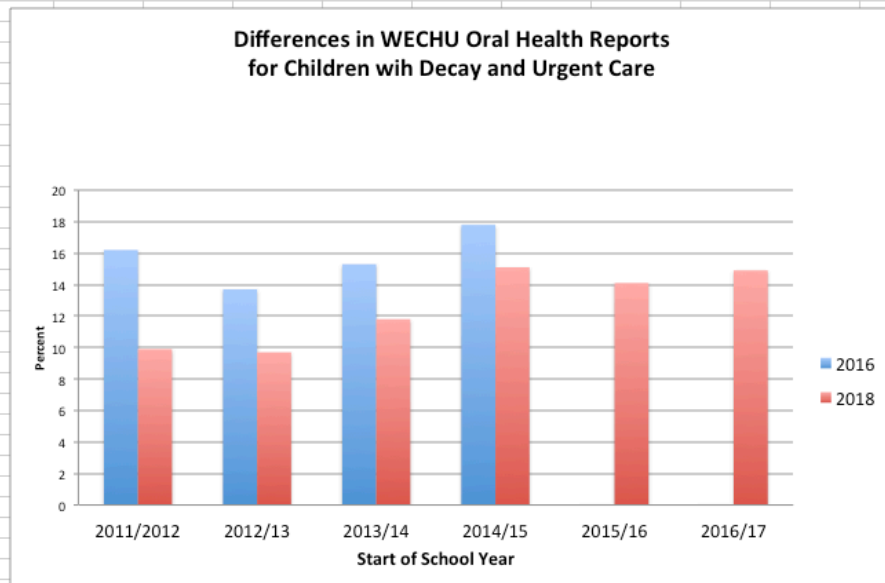


Source: Ambulatory Emergency External Cause [2010-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [March 19, 2018].

Health advisors made alarmist claims that Windsor has three times the average rate of day surgeries than the province....but we have **always** had higher rates and according to their own 2018 Oral Health report, the highest rates of decay-related surgeries occurred during fluoridation, prior to cessation in 2013.

Disturbingly, data previously reported in their 2016 report (blue) was altered in their 2018 report (red) so it appears there is an increasing trend in urgent care.

A	B	C	D	E	F	G	H	I	J	K	L
	2011/2012	2012/13	2013/14	2014/15	2015/16	2016/17					
2016	16.2	13.7	15.3	17.8							
2018	9.9	9.7	11.8	15.1	14.1	14.9					





Tuesday, January 8, 2019

To whom it may concern,

On behalf of the Ontario Dental Assistants Association (ODAA), please accept this letter of support for the continued community water fluoridation for the City of London as a key prevention strategy for dental caries.

The fluoridation of drinking water is one of the significant public health achievements of the 20th century. Community water fluoridation is a safe and effective means of preventing dental decay. There is a great deal of scientific evidence to support this claim and health and dental organizations worldwide endorse the safety and effectiveness of community water fluoridation. The level of fluoride in the drinking water is closely monitored by the City of London and the Middlesex-London Health Unit.

Many Ontarians do not have dental coverage and community water fluoridation, at the very minimum, provides benefits to all those who drink community water. Poor oral health can contribute to diabetes, heart disease, respiratory ailments, and other health concerns and tooth decay is one of the primary health concerns related to children. Community water fluoridation programs play a crucial role in improving the overall health of Canadians and have resulted in significant decreases in tooth decay rates with 35%-50% decrease in children and 30% decrease in adults.

The ODAA strongly supports community water fluoridation as a benefit to not only oral health, but to our overall health. If you require more information about ODAA and our support community water fluoridation in the City of London, please do not hesitate to contact us by phone at 519-679-2566 or by email at info@odaa.org.

Sincerely,

Carolyn Hibbs, PhD
Executive Director



Canadian Association of Public Health Dentistry
Association canadienne de la santé dentaire publique

www.caphd.ca

City of London
300 Dufferin Avenue
London, Ontario
N6A 4L9

January 17, 2019

Dear Civic Works Committee,

Re: Community Water Fluoridation

The health and oral health of most Canadians has improved significantly over the last 100 years and most of this improvement is attributable to advances in public health. There are various public health achievements that led to this remarkable feat. The fluoridation of drinking water has been recognized as one of these remarkable achievements by the Centre for Disease Control (CDC) and by the Canadian Public Health Association (CPHA). Community water fluoridation remains a major factor responsible for the decline in dental caries (tooth decay) during the second half of the 20th century.

Fluoride is a mineral that exists naturally in virtually all water supplies. Communities across Canada adjust the amount of fluoride in their community water source to levels that protect teeth from decay. Canadians have been doing this for nearly 70 years. That experience (and hundreds of studies and international experiences) demonstrates that fluoridation of drinking water remains safe and the most effective means of achieving community-wide exposure to cavity prevention effects of fluoride.

The Canadian Association of Public Health Dentistry (CAPHD) is the national voice of dental public health in Canada, representing primary oral health clinicians, scientists, educators, administrators, health promoters, and policy makers from across Canada and abroad. As an organization dedicated to dental public health in Canada, CAPHD promotes the use of scientific evidence. Below is a list of web-resources in support of water fluoridation from national and international experts who have carefully weighed the evidence.

- [Health Canada](#)
- [Center for Disease Control](#)
- [University of York: Systematic Review on Water Fluoridation](#)
- [Australia's National Health and Medical Research Council](#)

CAPHD recognizes the benefits of community water fluoridation and, based on this current evidence, recommend it as a safe, effective and economical public health measure. In addition, community water fluoridation is indispensable when it comes to improving the oral health of disadvantaged populations. The City of Calgary is already seeing poor oral health outcomes since removing fluoride from their water in 2011. Let's protect the health of the community by continuing community water fluoridation in the City of London.

Sincerely,



Dr. Mario Brondani, DDS, MSc, MPH, PhD.

CAPHD President

info@caphd.ca



Community Water Supply Fluoridation

The Ontario Dental Hygienists' Association (ODHA) is the voluntary professional association representing Ontario's registered dental hygienists. Dental hygienists are highly skilled in helping clients to attain and maintain optimum oral health. Clinical research has established a strong link between oral health and overall health. As members of the oral health care team, dental hygienists are responsible for client-centered professional treatment that helps to prevent periodontal (or gum) disease and dental caries (or cavities). Dental hygienists also focus on disease prevention.

Fluoride is a natural substance found in the earth's crust. It exists naturally in some water and food sources. Fluoride works by strengthening or remineralizing the outer layer of teeth (enamel) to prevent cavities from starting, to reduce the size and number of cavities, and to decrease tooth sensitivity. Children need fluoride protection while their teeth are developing. Adults also require fluoride since the possibility of root cavities (tooth decay in the roots of the teeth) increases with age. Water fluoridation is the best way to provide fluoride protection to a large number of people at low cost without the barrier of individual income or access to routine dental care. Where fluoride has been added to municipal water supplies, there has been a marked decline in tooth decay rates.

In its fact sheet on *Fluorides and Human Health*, Health Canada endorses the fluoridation of drinking water to prevent tooth decay. Furthermore, Health Canada goes on to state that "Many governments and health organizations, including Health Canada, the Canadian Public Health Association, the Canadian Dental Association, the Canadian Medical Association and the World Health Organization endorse the fluoridation of drinking water to prevent tooth decay." (<https://www.canada.ca/content/dam/canada/health-canada/migration/publications/healthy-living-vie-saine/fluoride-factsheet/community-water-fluoridation-eng.pdf>; <https://www.canada.ca/en/health-canada/services/healthy-living/your-health/environment/fluorides-human-health.html>)

The Canadian Institutes of Health Research in its report entitled *Oral Health Research - From Tooth Decay to Dental Implants* states that "... experts agree that water fluoridation is one of the most effective public-health measures ever undertaken. During the last 30 years or so, dental caries in children has decreased significantly throughout the industrialized world - the visible benefit of improved prevention programs - especially fluoridation of municipal water. Despite much controversy at the outset of the practice, retrospective studies comparing municipalities with and without fluoridated water have demonstrated conclusively that fluoridation programs have noticeably lowered rates of dental cavities." (www.cihr-irsc.gc.ca/e/11199.html)

With more than 50 years of extensive research that has consistently shown fluoride to be a safe, effective, and economical means of preventing and even reversing the early stages of tooth decay (dental caries) in all age groups, ODHA strongly supports fluoridation of community water supplies.



January 21, 2019

Civic Works Committee
City of London
Ontario

Dear Sir/Madam,

The Ontario Association of Public Health Dentistry (OAPHD) endorses community water fluoridation as a safe and effective public health intervention to reduce tooth decay. Researchers in different countries have published their findings in recognized peer-reviewed journals. Evidence confirms the safety and the effectiveness of adjusting the amount of fluoride in drinking water to optimal levels.

Recently, Public Health England published *Water Fluoridation: Health Monitoring Report for England 2018*. The findings of the report "are consistent with the view that water fluoridation is an effective and safe public health measure to reduce the prevalence and severity of dental caries, and reduce dental health inequalities" (Public Health England, 2018, p. 14). In 2017, the National Health and Medical Research Council (NHMRC) released the NHMRC *Public Statement 2017 - Water Fluoridation and Human Health in Australia*. The NHMRC "strongly recommends community water fluoridation as a safe, effective and ethical way to help reduce tooth decay across the population" (NHMRC, 2017).

The Government of Canada's (2016) position statement on Community Water Fluoridation states that:

- "Community water fluoridation is an important and often overlooked public health measure that has contributed over the last 70 years to the health of Canadians by preventing tooth decay and thereby improving oral health."
- "The big advantage of community water fluoridation is that it benefits all residents in a community, regardless of age, socioeconomic status, education, oral hygiene practices, employment or access to routine dental care, making it a truly equitable public health practice."
- "The likeliest adverse effect is an increased risk of mild dental fluorosis, which causes white specks to appear on the teeth and is usually unnoticeable."
- "Community water fluoridation remains a safe, cost effective and equitable public health practice and an important tool in protecting and maintaining the health and well-being of Canadians."



In 2015, Canada celebrated the 70th anniversary of community water fluoridation. Community water fluoridation is recognized by the Centers for Disease Control and Prevention as one of the ten great public health achievements of the 20th century.

Well-respected organizations around the world support community water fluoridation, including the World Health Organization, the Centers for Disease Control and Prevention, Health Canada, the Public Health Agency of Canada, and the Ontario Medical Association. In alignment with these organizations, I would encourage the elected leaders of the City of London to declare their support for this important public health measure.

Yours for better oral health,

Dr. Faahim Rashid, DDS MSc FRCD(C)
President, Ontario Association of Public Health Dentistry



References

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Via email: cwc@london.ca



January 4, 2019

Civic Works Committee
City of London
300 Dufferin Avenue
PO Box 5035
London, ON N6A 4L9

Dear Committee:

Re: Community Water Fluoridation

On behalf of the Canadian Dental Hygienists Association (CDHA), the collective national voice of more than 29,500 registered dental hygienists working in Canada, including over 200 CDHA members in London and surrounding area, I am writing to express our strong support for City Council to continue to keep its residents healthy by maintaining community water fluoridation in its public water system.

Fluoride is a mineral that exists naturally in virtually all water supplies. Communities, including London, adjust the amount of fluoride in their water source to levels that protect teeth from decay. Canadian communities have been adjusting fluoride levels in their water supplies for nearly 70 years. That experience, along with hundreds of studies and international experiences, validate water fluoridation as the most effective and safe means of achieving community-wide exposure to the cavity prevention effects of fluoride. Leading health authorities, including the [Public Health Agency of Canada](#), [Centers for Disease Control and Prevention](#), and the [Canadian Association of Public Health Dentistry](#), continue to support water fluoridation as a means of preventing tooth decay for all residents regardless of age, socioeconomic status, education, employment or dental insurance status.

Currently, more than 70% of Ontarians have access to this essential public health practice. For every \$1 invested in community water fluoridation, \$38 is avoided for dental treatment costs by reducing the need for fillings and other costly dental procedures; that's a return on investment of 3700%! On the other hand, when water fluoridation is discontinued, research demonstrates that the oral health of the community declines. For example, the City of Calgary discontinued fluoridation in 2011 and the rate of tooth decay increased significantly. Closer to home, the Windsor-Essex County Health Unit committed to looking at [community oral health data](#) over a period of five years following the discontinuance of water fluoridation in 2013. Unsurprisingly, City Council recently voted 8-3 to resume water fluoridation in response to the dramatic declines in the oral health of its residents.

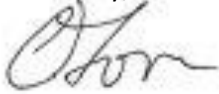
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THE CANADIAN DENTAL HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIREs

1122 Wellington St W, Ottawa, ON K1Y 2Y7 Tel. 613-224-5515 Fax 613-224-7283
info@cdha.ca Toll Free 1-800-267-5235 www.cdha.ca

As you continue to discuss community water fluoridation, I urge you to consider the overwhelming evidence that supports community water fluoridation. CDHA gives the City of London permission to publish this letter of support public and in the council meetings minutes. Please don't hesitate to contact me should you have any questions.

Sincerely,



Ondina Love
Chief Executive Officer

Encl: CDHA Position Statement: Community Water Fluoridation

cc: Christopher Mackie, Medical Officer of Health
Middlesex-London Health Unit
Christopher.Mackie@mlhu.on.ca

Misty Golding, Manager Oral Health
Middlesex-London Health Unit
misty.golding@mlhu.on.ca

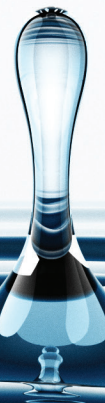


THE CANADIAN DENTAL
HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE
DES HYGIÉNISTES DENTAIRE

A close-up photograph of a water tap with a single drop of water falling from it. The background is a blurred, light-colored wall.

CDHA POSITION STATEMENT: COMMUNITY WATER FLUORIDATION

Endorsed by CDHA's Board of Directors, March 2017





Canadian Dental Hygienists Association Position Statement

The Canadian Dental Hygienists Association (CDHA) supports community water fluoridation (CWF) as an effective and equitable approach to helping prevent dental decay. The evidence clearly demonstrates that CWF protects the oral and overall health of communities. All levels of government must take steps to ensure that all Canadians benefit from CWF. Municipal governments should provide fluoridated water for residents. Provincial/territorial governments should amend pertinent legislation and regulations to require CWF for all municipal drinking water systems when source-water levels are below the optimal concentration range. Finally, the federal government must take a leadership role in developing a national community water fluoridation strategy, including investments in education about the science and evidence to support this vital preventive public health initiative.



Introduction

Oral health affects overall health, self-confidence, and quality of life. While many of us enjoy the benefits of good oral health, dental decay (cavities) is still a significant problem for Canadians.¹ For example, it is the leading cause of day surgery among children under the age of six, and children from disadvantaged communities have day surgery rates much higher than other Canadian children.² Dental decay can lead to pain and difficulty eating, and can put one at a significant educational and professional disadvantage because of lost school and work days due to illness. Community water fluoridation (CWF) has been used around the world as an equitable and cost-effective means of reducing cavities in all population groups.

The Importance of Fluoride for Oral Health

Fluoride is a mineral that exists naturally in the environment and in virtually all water supplies. Many communities adjust the level of naturally occurring fluoride in drinking water to protect against dental decay. This process is commonly known as CWF. The fluoride in drinking water helps to protect teeth in two ways. First, for Canadians of all ages, the fluoride mixes with saliva to help counteract acids in the mouth created by bacteria and sugar. These acids are responsible for dental decay. CWF provides teeth with consistent, low-level exposure to fluoride throughout the day and across a lifetime. Second, during children's tooth-forming years, the fluoride helps to strengthen the enamel of developing teeth, making them more resistant to decay and setting the foundation for good oral health. In 2013, CWF was identified as one of the US Centers for Disease Control and Prevention's ten greatest public health achievements of the 20th century.³

Safety, Effectiveness, and Equity

The safety and effectiveness of water fluoridation have been frequently studied and continue to be supported by scientific evidence. The ability of fluoridated water to prevent dental cavities in people of all ages has been well documented in the literature.²⁻⁷ Canadians have benefitted from CWF for over 70 years, which means that we have more than seven decades of evidence to show that this practice is an important, safe, and effective way to reduce dental decay across populations. Leading national and international health bodies, including Health Canada and the Public Health Agency of Canada, the Canadian Association of Public Health Dentistry, the World Health Organization, and the US Centers for Disease Control and Prevention, all strongly support CWF.

In addition to protecting against dental decay, CWF has been proven safe for overall health and for the environment.^{4,8} High-quality evidence does not support a link between exposure to fluoride in drinking water at the optimal concentration to protect dental health in Canada and adverse health effects, such as cancer risk, bone fracture, toxicity, and lowered IQ. Fluorosis is a change in the appearance of tooth enamel. It does not affect the health or function of the teeth. It is important to note that the prevalence of moderate to severe dental fluorosis was considered too low to report in the most recent oral health component of the Canadian Health Measures Survey.¹

One of the significant advantages of CWF is that it not only helps to reduce the scale and severity of dental decay, but it benefits residents in a community, regardless of age, socioeconomic status, education, employment or dental insurance status.^{7,9,10} This is particularly important because lower income Canadians are almost twice as likely to suffer from poor oral health than higher income Canadians.¹ Residents of a community with fluoridated drinking water can enjoy fluoride's protective benefits just by turning on the tap.

In addition, CWF is the most economical method of reducing the burden of dental disease in a population.¹¹⁻¹³ The cost to adjust fluoride levels in municipal drinking water supplies is much lower than the costs of restorative dentistry for children living without fluoridated water, and is also lower than the cost of providing other potential sources of fluoride to residents.¹⁰

The benefits of CWF extend beyond cost savings. Dental problems may lead to frequent absences from school and lost parental working days,^{14,15} which could have a significant impact on learning, productivity, and the larger economy. By reducing the risk of dental cavities in communities, CWF prevents needless pain, discomfort, stress, and quality of life burdens in people of all ages and circumstances.



The Regulation of Community Water Fluoridation in Canada

The responsibility of providing safe drinking water and CWF is shared by the federal, provincial/territorial, and municipal governments. Health Canada works in collaboration with the provinces and territories to maintain and improve drinking water quality by providing the scientific rationale and technical expertise to establish guidelines for fluoride in drinking water. Currently, the optimal concentration of fluoride to protect dental health in Canada is 0.7 mg/L or 0.7 parts per million, which takes into consideration all sources of fluoride.¹⁶

The primary enabling legislation for community water fluoridation is enacted at the provincial level, as the provincial and territorial governments regulate the quality of drinking water in their jurisdiction. However, the fluoridation of drinking water supplies is a decision that is made by each municipality.

In the United States, many states now require municipalities and counties to introduce and/or maintain CWF through mandates and legislation.^{17,18} These laws often specify the minimum population threshold to which these mandates are applicable. For example, Connecticut's law applies to community water systems serving at least 20,000 residents, while in other states the threshold may be 5,000 residents. The 2013–2018 Canadian oral health framework recommends that provincial and territorial governments adopt a similar approach by mandating the practice of CWF through legislation.¹⁹



Unequal Access to this Public Health Approach

Although CWF is supported locally, nationally, and internationally by governments and health organizations, there is still a small but vocal minority opposed to its use. As a result, some municipalities in Canada have discontinued CWF in recent years,²⁰ which is concerning because research on CWF cessation and dental decay points increasingly to a rise in cavities post-cessation.¹ Although some communities in Canada have discontinued water fluoridation, there is reason for hope. Many other communities have been successful in maintaining or initiating this practice thanks to the efforts of oral health practitioners, public health professionals, members of the

academic and research community, and concerned community representatives. Canadians are hearing their voices and starting to recognize oral health as an important public good.

Even in an era of widespread availability of fluoride from other sources, evidence continues to reaffirm that CWF, at the optimal concentration level, is a safe, effective, and socially equitable approach to reducing dental decay and does not pose risks for adverse health outcomes. Researchers from around the world conclude that community water fluoridation delivers a return on investment; it saves money as well as teeth!

Community water fluoridation remains an important, safe, effective, and equitable means of reducing dental decay in Canadian communities!





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THE CANADIAN DENTAL
HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE
DES HYGIÉNISTES DENTAIRES



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January 24, 2019

Attention: Civic Works Committee, City of London

Phone: 519-661-CITY (2489) ext. 0969

Fax: 519-661-4892

E-mail: cwc@london.ca

CC: Misty Golding RDH, MPH

Manager Oral Health

Middlesex-London Health Unit

misty.golding@mlhu.on.ca

(519.663.5317 ext. 2232)

Dear Members of the Civic Works Committee,

On behalf of the Royal College of Dental Surgeons of Ontario, the regulatory body mandated by provincial law to regulate the dental profession in the interests of public safety and protection, I wish to express our strong support for the fluoridation of the municipal water supply in the City of London.

Sixty-five years since the introduction of water fluoridation in Canada, it continues to be the most cost-effective and equitable strategy for the prevention of dental caries, the most prevalent infectious disease and the most common cause of tooth loss in humans.

The use of fluoridation as a therapeutic treatment continues to be supported provincially, nationally and internationally as a safe and powerful strategy to eliminate differences in health among people.

Water fluoridation has been studied extensively and is endorsed by major reputable and trustworthy scientific and government bodies, including Health Canada, the Centers for Disease Control and Prevention and the World Health Organization.

As the Centers for Disease Control and Prevention state: A significant advantage of water fluoridation is that all residents of a community can enjoy its protective benefit—at home, work, school, or play—simply by drinking fluoridated water or beverages and

Civic Works Committee, City of London

January 24, 2019

Page 2

foods prepared with it. A person's income level or ability to receive routine dental care is not a barrier to receiving fluoridation's health benefits.

I have attached the College's Policy Statement in support of fluoridation. Our support for fluoridation continues today.

We hope that the City of London will support this vitally important and cost-effective public health measure.

Yours truly,

A handwritten signature in black ink, appearing to read 'Flavio Turchet', written in a cursive style.

Dr. Flavio Turchet
President

Encl.

c.: Irwin W. Fefergrad, RCDSO Registrar

AMS:857722



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WATER FLUORIDATION

The Royal College of Dental Surgeons of Ontario (RCDSO) supports the fluoridation of municipal drinking water as an important approach to oral health promotion and disease prevention. RCDSO joins the Canadian Dental Association in affirming its support for fluoridation of municipal water supplies as an economical and effective means of preventing dental caries in all age groups.

BACKGROUND

Fluoride was first added to Canadian drinking water in Brantford, Ontario in 1945. Now more than 50 years later, fluoridation of drinking water is still the most economical means of getting the proven protection that it gives teeth. Although other fluoride-containing products are available, water fluoridation remains the most equitable and cost-effective method of delivering fluoride to all members of most communities, regardless of age, educational attainment or income level, and generally by a method that is not dependent on an individual's behaviour.

Where fluoride has been added to municipal water supplies, there has been a marked decrease in tooth decay rates – between 35% and 50% in children, and 30% in adults. Children need fluoride protection while their teeth are developing. Adults also need it since the possibility of caries on the exposed root surfaces of teeth increases as they get older.

The United States Centers for Disease Control and Prevention estimates that for every

dollar (US) spent on fluoridation, \$80 (US) is saved on dental care.

Community water fluoridation was hailed in 1999 by the Centers for Disease Control and Prevention as one of the 10 great public health achievements of the 20th century.

The Canadian Dental Association (CDA) agrees.

The appropriate uses of fluorides in the prevention of dental caries is one of the most successful preventive health measures in the history of health care.

Nearly 100 national and international organizations and governments endorse the fluoridation of drinking water to prevent dental decay. They include the Canadian Dental Association, the Canadian Public Health Association, the Canadian Medical Association, the Canadian Pediatric Society, Health Canada, the American Dental Association, the International Association for Dental Research, the World Health Organization, and the United States Public Health Service and its Centers for Disease Control.

Opponents to water fluoridation claim that it increases the risk for a range of health problems from cancer to Down's syndrome. The safety and effectiveness of water fluoridation have been re-evaluated frequently, and no credible evidence supports an association between fluoridation and any of these conditions.

Public exposure to fluoride has been increasing due to the presence of fluoride in food, in beverages, and in personal care products such as toothpaste, fluoride-containing mouthwash, and professionally applied fluoride gels and varnishes. In Ontario, the range for fluoride in

drinking water has recently been adjusted to reduce overall fluoride exposure. This recognizes that appropriate levels of fluoride in treated drinking water are beneficial due to the reduced incidence of dental caries in the population, while avoiding the potential negative effects attributable to excess fluoride exposure in areas where fluoride is added to drinking water.

**Adopted by the RCDSO Council
May 15, 2003**

This is a public letter written by Dr. Hardy Limeback to the Windsor Council and available on the Fluoride Free Windsor website: I trust that London Council will listen to this courageous dentist who risked his job, life and received many death threats for telling the truth of his research. A good question is: What if, despite the MOHs and others statements that it is safe and effective, he is correct? Remember, he is a true dental expert and recognized teacher, while the MOH is a doctor. Maybe using the Precautionary Principle and stopping artificial water fluoridation until it is proven safe for human consumption is a wise and reasonable position. As almost always, following the money may lead to the truth.

https://fluoridefreewindsor.com/2019/01/17/fluoride-expert-says-windsor-council-made-a-huge-mistake/?fbclid=IwAR04EfudkC5zpA_f16ERShRlCHaTP8wFUtX-KdFwLlckyn6qZEjv-BJb1o

Hello,

I am concerned you might make the same mistake that the Windsor council did and approve the addition of fluoride into your drinking water.

In my opinion, the new Windsor council made a huge mistake and I will try to explain why.

My background as a fluoride expert: I have a PhD in Biochemistry (1979) and a dental degree (1983) from University of Toronto. As a professor-dental scientist, I received many national grants to do laboratory and clinical research, mostly on the effects of fluoride on teeth and bones. At the same time, I maintained my own part-time dental office. It was in both my dental practice and supervising the thousands of patients in the Faculty of Dentistry clinics in my program that I noticed that almost every second child had some form of dental fluorosis (see below).

I was one of 12 scientists in North America chosen to serve on the U.S. National Academy of Science's committee that produced the 2006 report *Fluoride in Drinking Water*. Taking three years to complete, we reviewed over 1,000 studies. That report is still considered the most authoritative, comprehensive work ever done on the toxicity of fluoride.

I was trained in traditional dentistry, and for many years accepted the prevailing opinion of the establishment in Canada and the U.S. that water fluoridation is "safe and effective."

I was mistaken.

As I intensively studied the literature and performed my own research, the evidence clearly demonstrated that fluoridation is more harmful than beneficial. In 1999, I publicly changed my position. In doing so, I joined the vast majority of nations, cities and medical organizations throughout the world that *do not* endorse fluoridation. Indeed, 95% of the world's population drinks unfluoridated water.

Our NAS committee concluded unanimously that fluoride could harm the functions of several human organs in addition to developing teeth. These include the brain, the skeletal system (from which our immunity is derived), the thyroid and the kidney. We also determined that much more research needed to be done, especially regarding fluoride's effects on the brain, kidney disease, diabetes, hypothyroidism and cancer.

Nearly 13 years later, much research has been done, including major neurotoxicity studies led by Canadian and American scientists. A 2017 petition to the U.S. EPA to end fluoridation

documented that fluoride caused brain and/or central nervous system damage (mainly lowered IQ in children) in 57 out of 61 human studies, several at levels in fluoridated water, and 112 out of 115 animal studies. Moreover, our NAS review concluded unequivocally that fluoride lowers thyroid function. Hypothyroidism (low thyroid levels) in pregnant women is known to be linked to lower IQ's in their children.

As I mentioned, I have been alarmed at the skyrocketing rates of dental fluorosis, an irreversible disease caused by an excess of fluoride ingestion in small children. It causes a staining of the teeth with white splotches at mild levels and structural damage with yellow and brown stains at the moderate and severe levels. In the U.S., which fluoridates far more than Canada, the latest study (Neurath, Limeback et al, JDR Clin Trans Res, 2019 in press) found it has reached epidemic proportions – it now afflicts 72% of all 12-15-year-olds, with 27.9% moderate and 2.8% severe. All sources of ingested fluoride contribute to this toxic load, but water is by far the largest contributor. Higher fluorosis levels in children have also been linked to lower IQ's.

In this ongoing debate, this is what is perhaps the most disturbing to me: both before and after our 2006 report, fluoridation advocates have declared, with certainty, that fluoridation is safe for everyone. This assertion was, and is, contradicted by the science and is totally unjustified.

Why do so many dentists and others in Canada and the U.S. support this practice? Most people follow the pronouncements of authority figures like Health Canada, the U.S. CDC and dental associations.

I can't speak for any individual, but I believe most people, inside and outside the government, haven't reviewed the literature, especially on health risks. If they had, I think most would change their minds.

There's another factor, especially for professionals, which should be noted. If you speak out against fluoridation, you risk being criticized by these authorities and shunned by your peers. I know many dentists and physicians who oppose it but fear taking a public stance based upon these legitimate concerns.

Please consider leaded gas, leaded paint, asbestos, DDT, DES, tobacco and many other substances. They were all accepted as safe by the medical establishment until the research on their harm became so compelling that authorities had no choice but to ban or restrict their use. It often took 50 years or more for government action to catch up to the scientific warnings. Fluoridation is following exactly the same path.

The evidence opposing this practice is already extensive. It was clear to me in 1999 that scientists had already compiled enough data to call for its cessation. In the two decades since, hundreds of studies have further validated my earlier conclusions.

For the health and safety of your residents, I strongly urge you to oppose fluoridation.

Thank you for your consideration, and please feel free to contact me if you have any questions.

Dr. Hardy Limeback, BSc, PhD (Biochem) DDS hardy.limeback@gmail.com



Dr. Hardy Limeback BSc, PhD, DDS

Sept. 21, 2016

Ms. Madeline Drexler, Editor
Harvard Public Health
The Magazine of the Harvard T.H. Chan School of Public Health
Office for External Relations
90 Smith Street, Fourth Floor
Boston, Massachusetts 02120
RE: "Is Fluoridated Drinking Water Safe?" article in Harvard Public Health, Spring 2016

Dear Ms. Drexler:

I'm the former head of Preventive Dentistry at the University of Toronto. In addition to being a practicing dentist, I am a basic dental researcher/biochemist who has spent decades studying the effects of fluoride on teeth and bones.

I was one of 12 scientists in North America chosen to serve on the National Academy of Science's committee that produced the 2006 report *Fluoride in Drinking Water*. Taking three years to complete, it's considered the most comprehensive work ever done on the toxicity of fluoride. Our report has been online for more than ten years here
<https://www.nap.edu/catalog/11571/fluoride-in-drinking-water-a-scientific-review-of-epas-standards>)

I was trained in traditional dentistry and for many years accepted the prevailing opinion of the dental/medical establishment in Canada and the U.S. that water fluoridation is 'safe and effective', as has been expressed by the handful of letters opposing the article by Nicole Davis in your Spring Issue of this year

I was mistaken. It became clear to me that even at low chronic daily intakes of fluoride, such as those provided by fluoridation, susceptible and vulnerable groups of the population can experience ill health effects.

Our own research showed that

1. fluoride from water fluoridation accumulates in bone in adults to undesirably high levels (levels at which the bone is at risk of fracture)¹
2. fluoride intake at low daily doses changes tooth dentin,²
3. fluoridation causes dental fluorosis in children, especially those who are fed infant formula made with fluoridated water.³
4. dental fluorosis is irreversible damage to the teeth the moderate level of which is aesthetically objectionable and undesirable.⁴ It costs families untold amount of extra dental expenses to treat the objectionable fluorosis, which many studies have recently shown has increased to at least 1 in every 10th child in the US in fluoridated areas.



Dental fluorosis is a sign that fluoride at low daily intakes has harmed not only the teeth but also all the tissues that are susceptible to its effects: it has now been found to be associated with lowered IQ.^{5,6} Harvard's own Anna Choi's analysis of the fluoride and lowered IQ literature⁷ clearly implies that precautionary steps should be taken before the developing brains of any more newborn babies and young children are unnecessarily exposed to too much daily fluoride intake.

In addition, Table 8-2 of our NRC report identified endocrine injury at a small fraction of the dose a bottle fed infant receives.

The letters of support for fluoridation that were published on the website after the Davis article appear have tried to re-assure the readers that her article is incorrect or misleading and should even be retracted.

Here are some facts relative to those letters of support.

1. There has never been a level I quality study to show fluoridation works, especially today with widespread use of consumer products containing fluoride and fluoride provided professionally. As many of your readers would know Level I evidence is a Randomized Clinical Trial (a prospective, double blinded, randomized and placebo controlled clinical study), the same that is required for *any* drug to get approved by the FDA. It has been stated that an RCT for fluoridation on an individual basis cannot be conducted. This is untrue. I have proposed one for Alaska where all fresh water (including drinking water) is trucked into the small communities.
2. The Cochrane reviewers, failing to find any RCTs, settled for the much weaker, uncontrolled non-randomized before and after studies. Those studies were not double blinded and they were recognized for their high risk of bias because adjustments were not made to control for the many confounding factors that affect caries rates.
3. There have been claims that European countries provide alternative fluoride delivery systems such as adding fluoride to milk and salt. Only a small percentage of the European population has uses these sources of fluoride, and a handful of countries. Furthermore, studies trying to show the effectiveness of fluoridated salt or milk have had the same problems as the water fluoridation studies. There has never been a properly conducted RCT to show that these alternative delivery systems are effective {your can reference recent Cochrane reviews of F milk and F salt}.
4. One of the letters quoted our report saying, "The NRC report (2007) found that in the United States, the prevalence of severe dental fluorosis is "very low (near zero) at fluoride concentrations below 2 mg/litre." This is nearly three times the standardised fluoride concentration used in US fluoridation schemes." If one reads our report in its entirety, one would see another graph showing that severe fluorosis *does* occur below 2 ppm in communities where people have nutritional deficiencies. The 2 ppm fluoride in drinking water cut-off was obtained from US studies involving only healthy children. Nutritional deficiencies most certainly occur in the US. That is why the recent NHANES oral health survey found an increase in dental fluorosis in US children from previous years as more and more communities in the US adopted fluoridation.
5. It is often claimed that fluoridation results in very low exposure to humans at levels much lower than the studies that show harm. However, fluoridation at 0.7 ppm or 1 ppm is a concentration, not a dose. Drinking 1 L of fluoridated drinking water per day results in a daily *dose* of 0.7 to 1.0 mg/day. The weight of the subject is crucial. Thus, newborns weighing 5 kg that drink formula made with fluoridated water are exposed to a daily dose of 0.14 to 0.20 mg/kg. This level of exposure causes dental fluorosis. As stated above, dental fluorosis is linked to lowered IQ. Furthermore, fluoride accumulates in bone throughout life. No study has yet determined the lifelong effect of fluoride accumulation in the bone on the immune system (derived from bone)

or on the structural integrity of bone. It is disingenuous to claim that fluoridation is safe when its safety in the elderly exposed for an entire lifetime has never been tested.

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4. Limeback H, Vieira AP, Lawrence H. Improving esthetically objectionable human enamel fluorosis with a simple microabrasion technique. *Eur J Oral Sci*. 2006 May;114 Suppl 1:123-6; discussion 127-9, 380.
5. Tang QQ, Du J, Ma HH, Jiang SJ, Zhou XJ. Fluoride and children's intelligence: a meta-analysis. *Biol Trace Elem Res*. 2008 Winter;126(1-3):115-20.
6. Ding Y, YanhuiGao, Sun H, Han H, Wang W, Ji X, Liu X, Sun D. The relationships between low levels of urine fluoride on children's intelligence, dental fluorosis in endemic fluorosis areas in Hulunbuir, Inner Mongolia, China. *J Hazard Mater*. 2011 Feb 28;186(2-3):1942-6.
7. Choi AL, Sun G, Zhang Y, Grandjean P. Developmental fluoride neurotoxicity: a systematic review and meta-analysis. *Environ Health Perspect*. 2012 Oct;120(10):1362-8.

Thank you for publishing Nicole Davis' article. Clearly it has sparked several responses from the proponents of fluoridation who continue to ignore the mounting evidence of fluoride toxicity in humans. I trust you will allow this letter in support of the Davis article to be posted on your website.

Sincerely



Dr. Hardy Limeback, BSc, PhD, DDS
Professor Emeritus and former Head, Preventive Dentistry
Faculty of Dentistry, University of Toronto

Submission to the London ON Civic Works Committee

For Feb. 05, 2019 Public Record

by

Dr. Hardy Limeback BSc PhD (Biochem) DDS

Professor Emeritus, Faculty of Dentistry, University of Toronto

Member of the US NRC 2006

Committee on Fluoride in Drinking Water

The great fluoride debate

By Denis Langlois, Sun Times, Owen Sound
Friday, January 31, 2014 10:18:40 EST AM

Dr. Hazel Lynn,
Medical officer of health,
Owen Sound, Ontario



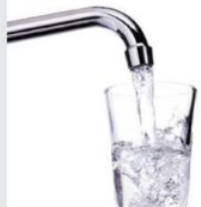


Medical officer of health Dr. Hazel Lynn holds up a picture of a child's teeth. Lynn said water fluoridation prevents tooth decay and is a safe practice. Others disagree. (JAMES MASTERS/QMI AGENCY)

This tooth decay
is NOT caused by
a 'lack of fluoride'
in the drinking
water!!

This is scare-
mongering


Public health fluoride policy confusion

	=		=	
fluoride supplement		Pea-sized dab of toothpaste		One glass of 0.7ppm water
0.25mg of fluoride		0.25mg of fluoride		0.25mg of fluoride
DO NOT prescribe for babies		Monitor children! Make sure they SPIT IT OUT!		No Risk. SWALLOW REPEATEDLY!

Fluoridation Ineffectiveness

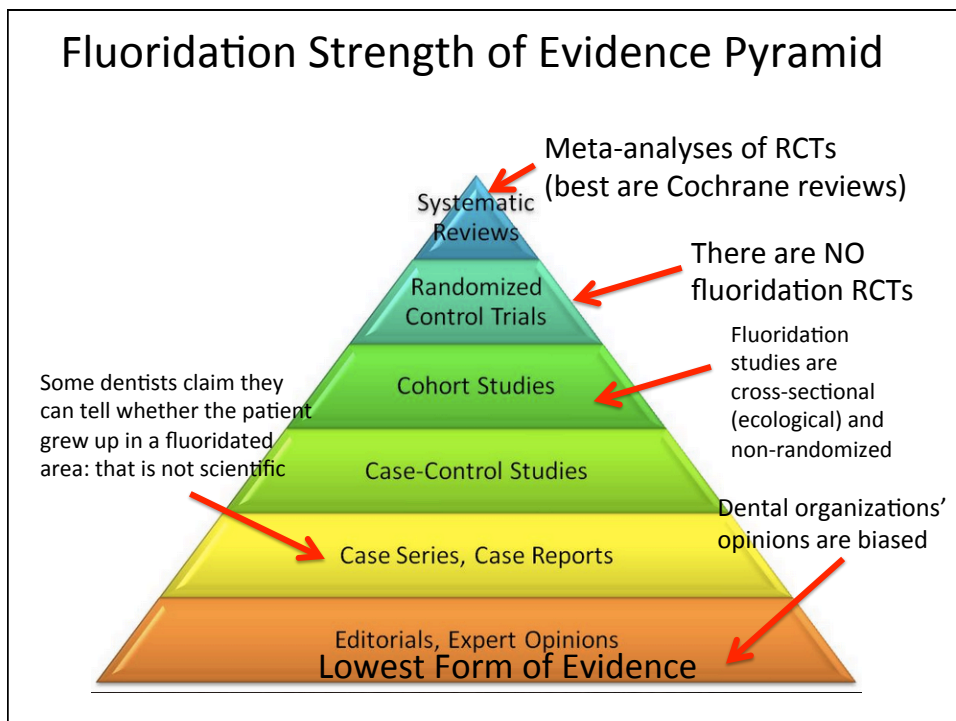
- Not one double blinded, randomized clinical trial (standard for drug approval) was ever conducted to prove fluoridation works.
- The most recent cross-sectional study (Slade et al) showed that at most 0.5 teeth/person are saved from decay after 20 years of fluoridation

Most Canadian Communities Have Rejected Water Fluoridation



**As Of 2015 Less Than 30% Of Canadians Receive
Artificially Fluoridated Tap Water
Most Canadian's Have Said No To Fluoridation**

<http://cof-cof.ca/>



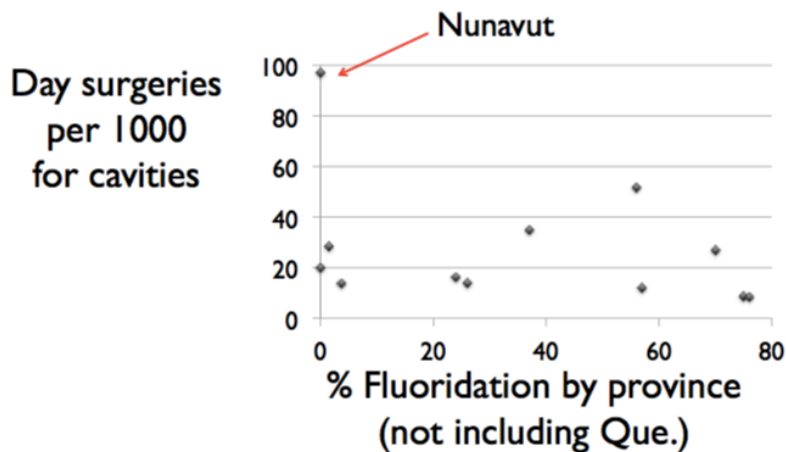
No Randomized Clinical Trial for Fluoridation!

Can epidemiology studies comparing fluoridated areas with non-fluoridated areas be used to estimate benefits? NO, not even if all these confounders are considered

Confounders	Slade et al, 2018	Confounders	Slade et al, 2018
ethnicity, genetics	yes	salivary buffering capacity	no
gender	yes	Vitamin D status	no
age	yes	use of fluoridated toothpaste	no
sucrose exposure	no	access to dental care, -professional fluorides, -dental sealants, -chlorhexidine	no
education	yes	enamel hypoplasia prevalence	no
income	no		
rural vs urban	partial		
overall health	no		
trace element exposure -Sr, Pb, Ca, Mg	no		
salivary flow	no		

See Neurath, Beck, Limeback et al. Commun Dent Oral Epid. 2017 for a discussion

Fluoridation in Canada DOES NOT reduce day surgeries required to treat rampant dental decay




http://www.hc-sc.gc.ca/ahc-asc/alt_formats/pacrb-dgapcr/pdf/branch-dirgen/wfc-efc-eng.pdf
<https://www.cihi.ca/en/access-data-reports/results?query=surgeries%2C+dental%2C+province&Search+Submit=>

Canadian Dental Association Recommendation to prevent dental fluorosis “the total daily fluoride intake from all sources should not exceed 0.05-0.07 mg/kg/day”

Infant Formula up to 0.5 ppm

Fluoridated water 0.7 – 1.0 ppm

400% higher
= 0.20 mg fluoride/kg/day



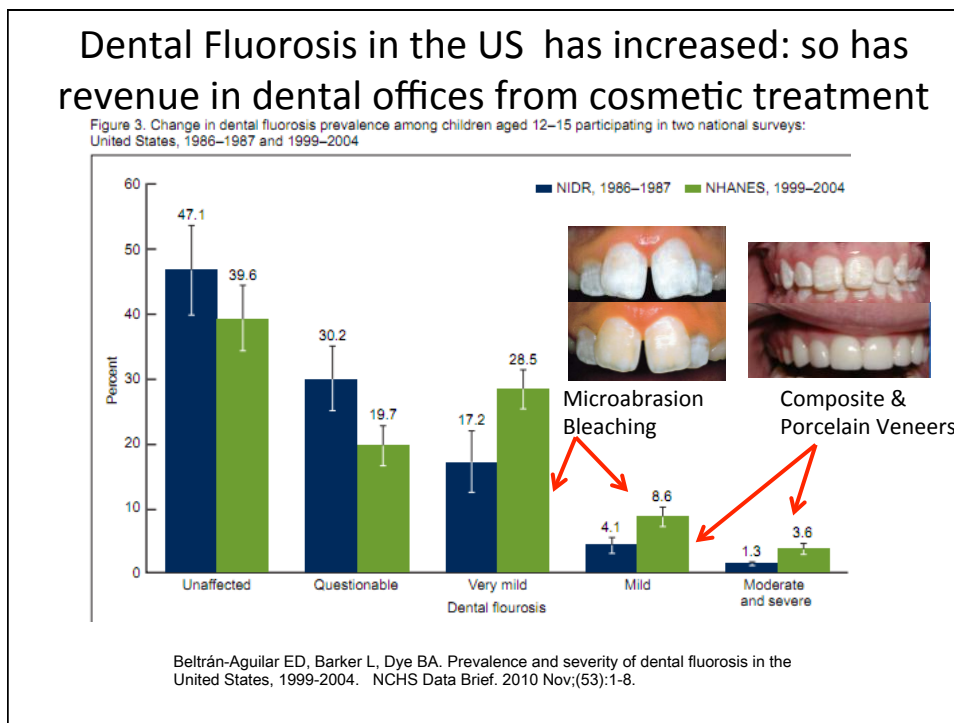
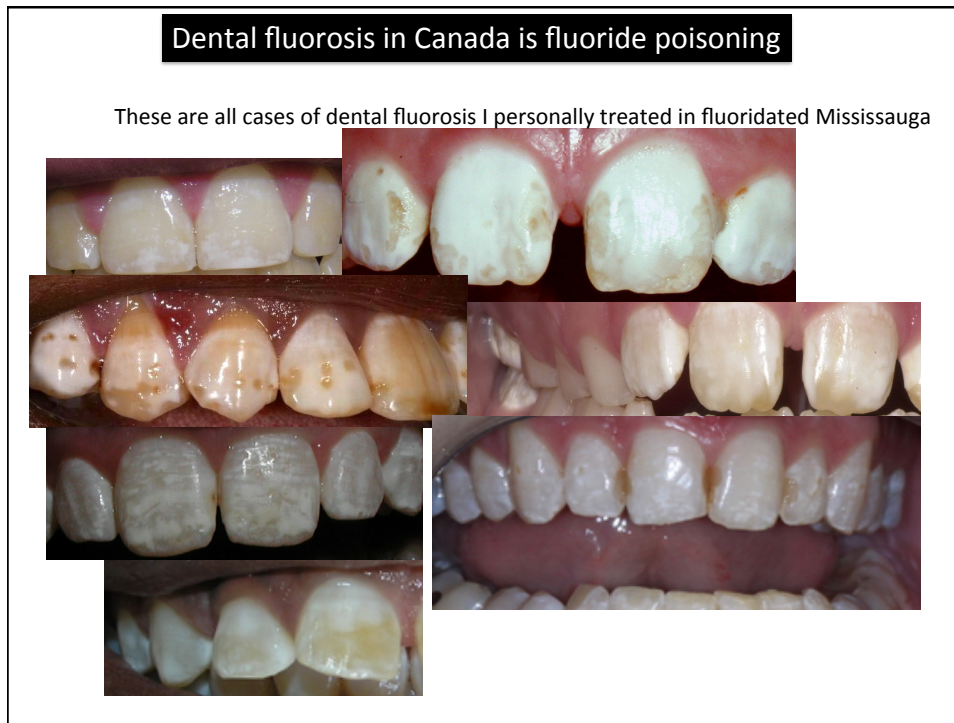
Who monitors my fluoride intake?

The diagram illustrates the combination of fluoride sources for an infant. On the left, a can of Enfamil ProSobee Infant Formula (up to 0.5 ppm) is shown next to a pack of Nursery brand fluoridated water (0.7-1.0 ppm). A plus sign and an equals sign connect these to a photograph of a baby drinking from a bottle. A red arrow points from the text '400% higher' to the baby's bottle, indicating that the total fluoride intake from these sources is 400% higher than the recommended limit of 0.05-0.07 mg/kg/day, resulting in 0.20 mg fluoride/kg/day. The text 'Who monitors my fluoride intake?' is written at the bottom of the baby's photo.

Fluorosis Cover Up



Half de-bonded composite veneer on a front tooth of an 11 yr. old child

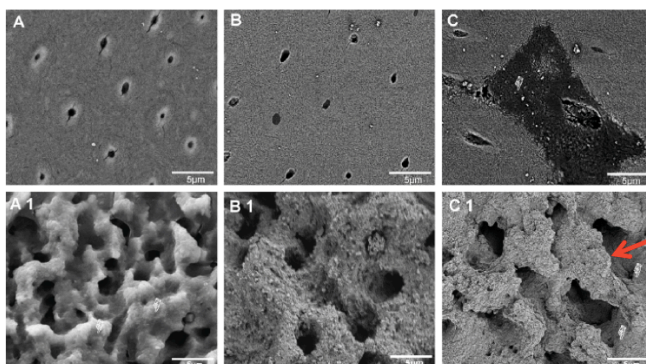


Caries susceptibility of human fluorosed enamel and dentine

P.G.K. Waidyasekera^{a,*}, T. Nikaido^a, D.D.S. Weerasinghe^a, K.A. Wettasinghe^b, J. Tagami^{a,c}

JOURNAL OF DENTISTRY 35 (2007) 343-349

347



Moderately fluorosed dentin is more susceptible to acid attack (caries)

Fig. 4 - SEM images of the dentine surfaces. (A) Non demineralized polished surface of the normal dentine. (B) Non demineralized polished surface of the mild fluorosed dentine. (C) Non demineralized polished surface of the moderately fluorosed dentine showing an area of interglobular dentine (pointer). (A1) Normal demineralized dentine showing the spongy appearance of the intertubular dentine (pointer). (B1) Mild fluorosed demineralized dentine. (C1) Moderately fluorosed demineralized dentine showing irregular shaped tubular orifices (pointer).

Fluoridation- a lousy trade off from 40 years of exposure

One tooth might have been saved from dental decay
.....but look at the dental fluorosis



out of 100 children
100 fillings might be saved
=\$20,000

8.6%	<p>Mild</p>	<p>8.6 children out of 100 needing cosmetics at \$1000/child = \$8,600</p>
3.6%	<p>Moderate</p>	<p>3.6 children requiring cosmetics up to \$20,000/child = \$72,000</p>
	<p>Severe</p>	<p>Total = \$80,600</p>

CDC (2004) "The prevalence of very mild fluorosis increased from 17.2% to 28.5% and mild fluorosis increased from 4.1% to 8.6%. The prevalence of moderate and severe fluorosis increased from 1.3% to 3.6%".

“Moderate + severe fluorosis has reached epidemic proportions in the US. 30% of children have fluorosis that needs treatment.”

Dr. Hardy Limeback BSc PhD DDS

Prof. Emeritus, Former Head of Preventive Dentistry, University of Toronto
Member of the 2006 NRC Committee on Fluoride in Drinking Water

Neurath, Limeback et al. JDR Clin Trans Res
in press

Lead poisoning

Burton's Lines-bluish discoloration of the gums



Arsenic Poisoning

Mees Lines on the fingernails



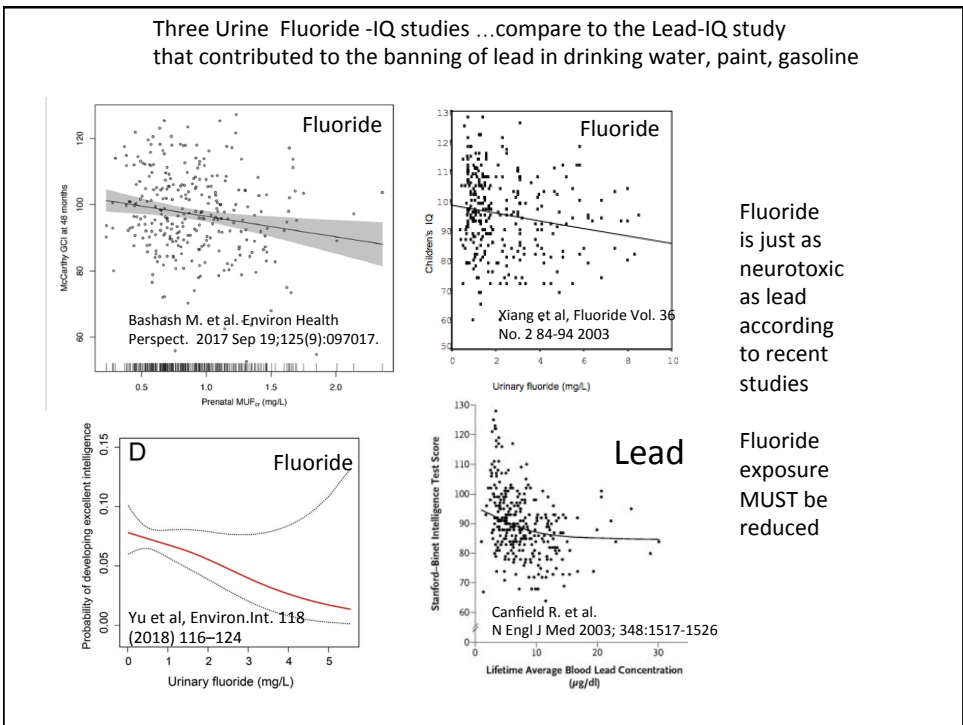
Cosmetic signs (lines) of lead, arsenic, fluoride overdoses.....

poisoning is poisoning !!

Fluoride Poisoning

-mild dental fluorosis lines on teeth





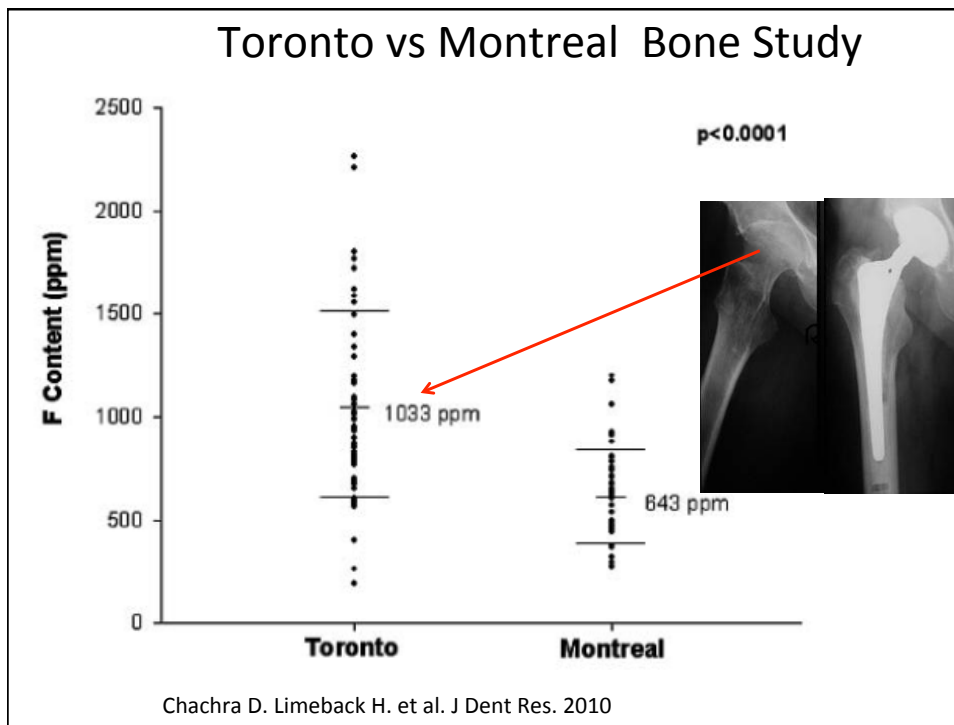
Effect of fluoride accumulation in bone on bone cells

Osteoclast resorbing bone

>1000 ppm fluoride in bone

- early bone cell death
- release of high F- levels to immune cells
- change in bone architecture

NRC Report 2006



...may induce malignant tumours!

[AREA OF CONCERN]

IS FLUORIDE WEAKENING BONE?

Scientists have focused on fluoride's effects on bone because so much of the chemical is stored there. Studies have shown that high doses of fluoride can stimulate the proliferation of bone-building osteoblast cells, raising fears that the chemical may induce malignant tumors. Fluoride also appears to alter the crystalline structure of bone, possibly increasing the risk of fractures.

▲ Normal Bone Formation

▲ Effects of Excessive Fluoride

Fagan. D. Second thoughts about fluoride. Sci Amer Jan, 2008, 74-81.

Fluoride kills cartilage cells

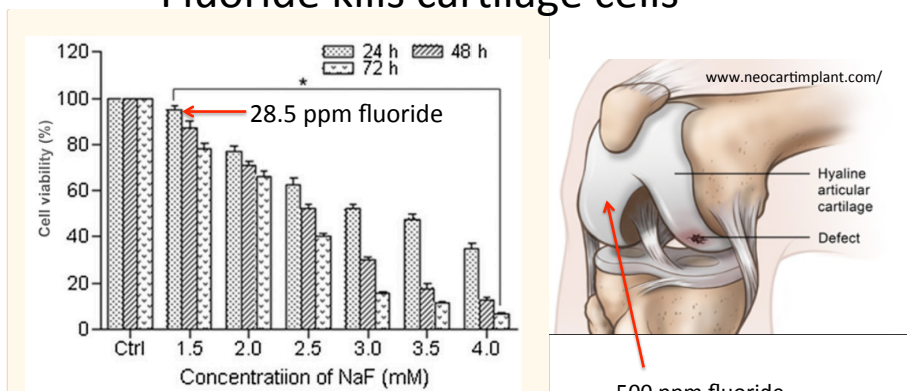


Figure 2

Sodium fluoride (NaF) inhibited cell viability of primary cultured rat chondrocytes. The effect of NaF on cell viability was measured by MTT assay. Cell viability of chondrocytes treated with gradient doses of NaF for 24, 48 and 72 h were decreased compared with that of the control groups, and were inhibited in a dose- and time-dependent manner. *P<0.05 vs. control.

MENG H, ZHANG T, LIU W, et al. Sodium fluoride induces apoptosis through the downregulation of hypoxia-inducible factor-1 α in primary cultured rat chondrocytes. International Journal of Molecular Medicine. 2014;33(2):351-358. doi:10.3892/ijmm.2013.1576.

Kosik-Bogacka et al. FLUORIDE CONCENTRATION IN SYNOVIAL FLUID, BONE MARROW, AND CARTILAGE IN PATIENTS WITH OSTEOARTHRITIS Fluoride 51(2)164-170, April-June 2018

SO DOCTOR, WHAT CAN I DO TO PREVENT MY ARTHRITIS? I READ FLUORIDE IN MY JOINTS CAN CAUSE MY SYMPTOMS.



SHOULD I STOP DRINKING TEA? CAN YOU TEST MY FLUORIDE LEVELS?

Edition: ENGLISH DEUTSCH ESPAÑOL FRANÇAIS PORTUGUÉS Register Log In

Medscape Saturday, November 3, 2018

NEWS & PERSPECTIVE DRUGS & DISEASES CME & EDUCATION ACADEMY VIDEO NEW

News > Medscape Medical News > Psychiatry News

Prenatal Fluoride Exposure Linked to ADHD in Kids

George W. Citroner
October 18, 2018

27 Read Comments

Not sure about causes of ADHD?

This could be the main cause!

Recommendations

- Brain Injury an Independent Risk Factor for ADHD in Kids
- ADHD Prevalence Rises, but Reasons Remain Unclear
- Autoimmune Disease Linked to ADHD

Prenatal exposure to higher levels of fluoride not only impairs cognitive development but also significantly increases the incidence of attention-deficit/hyperactivity disorder (ADHD) in children, new research shows.

"Our current study suggests that fluoride not only interferes with overall IQ or overall cognitive development but may also contribute to symptoms of ADHD," lead investigator Morteza Bashash, PhD, Dalla Lana School of Public Health, University of Toronto, Canada, told Medscape Medical News.

With respect to geographic region, the Western United States (**more cities that are non-fluoridated**) had the lowest rate of ADHD (7.0%), the Midwest had the highest (12.2%), and the Northeast (10.3%) and South (11.1%) were in the middle.

Fluoride poisons the pineal gland

X

✓

0.25 mg fluoride 2X/day

Warnings: Keep out of reach of children under 6 years of age. If you accidentally swallow more than used for brushing, get medical help or contact a Poison Control Center immediately.

+

F-
Fluoride

0.7 ppm fluoride water

0.25 mg fluoride 4X/day

Cerebral cortex
Pineal gland
Suprachiasmatic nucleus
Optic chiasm
Pituitary
Hypothalamus

Fluoride effect on the pineal gland

- interferes with melatonin (sleep cycles)
- lowers energy levels
- implicated in increasing obesity

Barrenetxe J, Delagrang P, Martínez JA. Physiological and metabolic functions of melatonin. J Physiol Biochem. 2004 Mar;60(1):61-72.

Fluoridation workers at risk

Facial and forearm burns from splatter of H₂SiF₆



Severely eroded and broken down teeth



When there is a fluoride spill, hazmat teams are called

Fluoride Spill WQAD News 8

lifelong health issues from fluoride poisoning after one exposure



19:02 / 20:06

Our Daily Dose

Our Daily Dose: excellent short film by Jeremy Seifert

Dear Members of the London Civic Works Committee,

Please accept this email and 3 attachments as my submission for your meeting of Feb. 5th, 2019.

Attachments:

1. Optimally Fluoridated Water Delivers Contraindicated Doses Every Single Day to the Most Vulnerable, which contains **Statements from Health Canada that contradict the agency's support for fluoridation of municipal water**.

2. My presentation slides submitted to Tecumseh Council for their meeting of Jan. 29, 2019, entitled Problems with the Windsor-Essex County Health Unit's Oral Health Report 2018 and statements made by Acting Medical Officer of Health Dr. Wajid Ahmed on Dec. 17 2018 in Windsor.

This document draws attention to 3 critically important fluoride studies published over the last 1.5 years, and shows recent examples of why municipal Councillors in Ontario unfortunately cannot blindly rely upon Medical Officers to provide accurate, meaningful input when it comes to water fluoridation.

Please also note that I searched the ML health unit's website and was unable to find oral health screening results. I was hoping to learn at which ages residents are examined in London for dental fluorosis. As you will see in the above attachment, the WEC health unit reports only on children too young to meaningfully assess for this condition (the same is true in my community of Peel Region). They also irresponsibly dismiss cases of mild dental fluorosis as irrelevant, and they falsely state that dental fluorosis is simply a cosmetic condition. I suspect that something similar is happening in your community, and urge you to look into this.

[I did eventually find the 2018 ML annual oral health report via google, and see that it does not report on dental fluorosis at all:

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=2ahUKEwipq8e_qoofgAhXno4MKHciiCiwQFjADegQICRAC&url=https%3A%2F%2Fwww.healthunit.com%2Fuploads%2F2018-09-20-report-058-18-appendix-a.pdf&usq=AOvVaw2cZSFyFN7RGSCeRlCNScUw]

3. Contrived and fraudulently inflated public support for water fluoridation. This document contains another example of how the WEC health unit misled Windsor Council, thus influencing the outcome of their Dec. 17, 2018 vote on water fluoridation.

Thank you, and best wishes,
Christine Massey, M.Sc.

**“Optimally” Fluoridated Water
Delivers Contraindicated Doses
Every Single Day
to the Most Vulnerable**

**(Fetuses, Infants and Young Children, Especially in
Low Income Families
that Cannot Afford Unfluoridated Water)**

and

**Statements from Health Canada that contradict the
agency’s support for fluoridation of
municipal water**

Christine Massey, M.Sc.

Health Canada on Fluoride

*“Health Canada does **not** consider fluoride as an essential nutrient.”*

http://www.oag-bvg.gc.ca/internet/English/pet_221_e_30308.html

*“Fluoride supplements... **Only** take them if an oral health professional advises you to.”*

<https://www.canada.ca/en/health-canada/services/healthy-living/your-health/environment/fluorides-human-health.html#s3>

The fluoride doses received by children from drinking fluoridated water are similar to doses in oral supplements

http://www.oag-bvg.gc.ca/internet/English/pet_299C_e_35212.html

2

Statements from Health Canada on Fluoride

*“The action of fluoride is **topical**.”*

*“**No fluoride** should be given before the teeth have erupted.”*

*“Supplemental fluoride should be given **only after 6 months of age and only in the following conditions...**”*

*“Supplemental fluoride should be in mouthwash, lozenges or drops diluted in water and **sprayed on the teeth**.”*

<https://www.canada.ca/en/health-canada/services/first-nations-inuit-health/health-care-services/nursing/clinical-practice-guidelines-nurses-primary-care/pediatric-adolescent-care/chapter-7-nutrition.html>

3

Health Canada on Fluoride

*Young children tend to swallow toothpaste → **increased risk of dental fluorosis***

*Up to 3 years of age: brush with **rice sized grain** of fluoride toothpaste twice per day **only if** the child is at risk of developing cavities; if not at risk brush with water*

*3 - 6 years: help children brush their teeth with a **pea-sized bit** of fluoride toothpaste*

<http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/viron/fluor-eng.php>

4

Health Canada on Fluoride

Toothpastes with fluoride are **drugs** since fluoride prevents caries; toothpastes without fluoride are cosmetics...

<https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/industry-professionals/labelling-cosmetics.html>

Required warning on fluoride toothpaste:

“Keep out of reach of children under 6 years of age. If a quantity greater than the dose used for brushing is accidentally swallowed, get medical help or contact a Poison Control Centre right away (FDA 1995).”

<http://webprod.hc-sc.gc.ca/nhp/iddipsn/atReg.do?atid=oral.health.sante.bucco.dentaire>

5

CDC on Children’s Fluoride Exposure from Toothpaste

Children <6 years & especially <2 years have poor control of swallowing reflex → **increased risk for dental fluorosis**

So use **only a pea-sized bit of toothpaste**

Supervise them and **have them spit it out**

One gram of toothpaste has approx. 1 mg of fluoride

A pea-sized bit of toothpaste is approx. 0.25 g toothpaste (and therefore contains approx. 0.25 mg fluoride)

<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm>

6

Health Canada on Dental Fluorosis: Caused by Fluoride Overexposure

“a permanent hypomineralization of tooth enamel due to fluoride-induced disruption of tooth development... in people with high exposure... occurs only when exposure to fluorides happens during tooth formation”



- Guidelines for Canadian Drinking Water Quality Technical Document Fluoride, 2010:
<https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-fluoride/page-3-guidelines-canadian-drinking-water-quality-guideline-technical-document-fluoride.html#101>

Public Health attitude: “Not an adverse effect”; publish fraudulent, misleading reports that hide actual prevalence

7

FDA & Health Canada Require Warnings on Fluoride Toothpaste



8

Canadian Dental Association

*“... use of fluoridated toothpaste in this age group is determined by the level of risk. Parents should consult a health professional to determine whether a **child up to 3 years of age** is at risk of developing tooth decay. **If such a risk exists, the child’s teeth should be brushed by an adult using a minimal amount (a portion the size of a grain of rice...)** of fluoridated toothpaste.*

***Children from 3 to 6 years of age should be assisted by an adult in brushing their teeth. Only a small amount (a portion the size of a green pea...)** of fluoridated toothpaste should be used.”*

https://www.cda-adc.ca/_files/position_statements/fluoride.pdf

9

Problem: Fluoridated Water

In fluoridated water with 0.70 mg fluoride per litre (aka 0.7 ppm)...

...each 350 ml, or 0.35 litre, of water contains:

$0.35 \text{ L} \times 0.70 \text{ mg/L} = \mathbf{0.245 \text{ mg fluoride}}$...

...the same **dose** found in a pea-sized bit of F toothpaste that everyone agrees must be **spit out** by young children due to **increased risk of dental fluorosis...** and **call poison control if they swallow >0.25 mg**



Consumed Daily, Year after Year, No Warnings Provided to the Public

**Problems with
the Windsor-Essex County Health Unit's
Oral Health Report 2018
and
statements made by
Acting Medical Officer of Health
Dr. Wajid Ahmed
on Dec. 17 2018
in Windsor**

Christine Massey, M.Sc.
Fluoride Free Peel

**Bashash et al. study: Prenatal fluoride exposure
& ADHD symptoms in children in Mexico City**

October 2018



What's New

Higher levels of urinary fluoride associated with Attention Deficit Hyperactivity Disorder (ADHD) in children

"... experts from University of Toronto, York University, National Institute of Public Health of Mexico, University of Michigan, Indiana University, University of Washington and Harvard School of Public Health..."

<http://www.dlsph.utoronto.ca/2018/10/higher-levels-of-urinary-fluoride-associated-with-attention-deficit-hyperactivity-disorder-adhd-in-children/>

"Our findings are consistent with a growing body of evidence suggesting that the growing fetal nervous system may be negatively affected by higher levels of fluoride exposure"

-- lead author Dr. Morteza Bashash

"...builds off of previous research the team published on this population demonstrating that higher levels of urine fluoride during pregnancy are associated with lower scores on tests of IQ and cognition in the school-age children"

**Earlier study from Bashash et al.
Prenatal fluoride exposure & lower IQ**

Study: Fluoride levels in pregnant women in Canada show drinking water is primary source of exposure to fluoride



MEDIA RELEASES

Fluoride exposure in utero linked to lower IQ in kids, study says

September 19, 2017

CNN | September 19, 2017

Research led by Dalla Lana's Howard Hu finds a correlation between higher fluoride levels and lower IQ scores in children. [Read more.](#)

<https://media.utoronto.ca/u-of-t-in-the-news/fluoride-exposure-in-utero-linked-to-lower-iq-in-kids-study-says/>

Study: <https://ehp.niehs.nih.gov/doi/10.1289/ehp655>

TORONTO, October 10, 2018 – A new study led by York University researchers has found that fluoride levels in urine are twice as high for pregnant women living in Canadian cities where fluoride is added to public drinking water as for those living in cities that do not add fluoride to public water supplies.

The study "Community Water Fluoridation and Urinary Fluoride Concentrations in a National Sample of Pregnant Women in Canada" was published today in *Environmental Health Perspectives*. It is the first study in North America to examine how fluoride in water contributes to urinary fluoride levels in pregnant women. The research was conducted as part of a larger study funded by the National Institute of Environmental Health Sciences, part of the National Institutes of Health (NIH) investigating whether early life exposure to fluoride affects the developing brain.

"The levels of fluoride among pregnant women living in fluoridated communities in Canada were similar with levels reported in a prior study of pregnant women living in Mexico City..."

"This finding is concerning because prenatal exposure to fluoride in the Mexican sample has been associated with lower IQ in children."

-- Christine Till, lead author

<http://news.yorku.ca/2018/10/10/study-fluoride-levels-in-pregnant-women-in-canada-show-drinking-water-is-primary-source-of-exposure-to-fluoride/>

Study: <https://www.sciencedirect.com/science/article/pii/S0160412018311814>

Reassurance from Dr. Ahmed, Acting Medical Officer re: Bashash et al. studies, Windsor, Dec. 17, 2018

Dr. Ahmed responds to question from Councillor Kusmierczyk re the studies:

"...this document is recently prepared by Public Health Ontario, our scientific body, and it touches on, specifically on **those studies**, and I would just say that **those studies**, and I'm quoting verbatim.."

Then reads a dismissive quote from page 9 under *Neurobehavioral Effects* in PHO's [Evidence Review for Adverse Health Effects of Drinking Optimally Fluoridated Water \(2010-2017\)](#)

Problem: PHO's evidence review only covers literature published as of May 10, 2017 (see pg 11);
Bashash et al. studies were published later;
Dr. Ahmed misled Council

Video: <http://csg001-harmony.sliq.net/00310/Harmony/en/PowerBrowser/PowerBrowserV1/20181218/-1/4023>

**Public Health Ontario's
Evidence Review for Adverse Health Effects of Drinking Optimally Fluoridated Water (2010-2017)**

Discussion and Conclusion

pg 11: This report is a summary of the evidence published since the 2010 Health Canada fluoride document to May 10, 2017 about the adverse health effects of optimally controlled fluoridated water, including the effects when mixed with infant formula.

pg 9: **Neurobehavioral effects**
Two primary studies, one in New Zealand²⁹ and another in the US,¹⁸ as well as one grey literature report¹² assessed the neurobehavioral effects of fluoridated water.

pg 17: 18. Bogstrand ST, Normann PT, Rossow I, Larsen M, Morland J, Ekeberg O. Prevalence of alcohol and other substances of abuse among injured patients in a Norwegian emergency department. *Drug & Alcohol Dependence*. 2011;117:132-8. ??

pg 17: 29. Abavare L, Abavare C. Wound botulism resulting from heroin abuse: can you recognize it? *Journal of emergency nursing: JEN* : official publication of the Emergency Department Nurses Association. 2012;38:301-3.

**Public Health Ontario's
Evidence Review for Adverse Health Effects of Drinking Optimally Fluoridated Water (2010-2017)**

46 references; none with "fluoride" or "fluoridation" in the title.

References

8. Amann M, Romer LM, Subudhi AW, Pegelow DF, Dempsey JA. PMC2075206; Severity of arterial hypoxaemia affects the relative contributions of peripheral muscle fatigue to exercise performance in healthy humans. *J Physiol (Lond)*. 2007;581:389-403.

pg 16: 9. Martinez D, Saccone PA, Liu F, Slifstein M, Orłowska D, Grasseti A, et al. Deficits in dopamine D(2) receptors and presynaptic dopamine in heroin dependence: commonalities and differences with other types of addiction. *Biol Psychiatry*. 2012;71:192-8.

10. Miller P, McKenzie S, Lintzeris N, Martin A, Strang J. The community impact of RIOTT, a medically supervised injectable maintenance clinic in south London. *Mental Health and Substance Use: Dual Diagnosis*. 2010;3:248-59.

11. Oviedo-Joekes E, Guh D, Marsh DC, Brissette S, Nosyk B, Krausz M, et al. Characteristics and response to treatment among Aboriginal people receiving heroin-assisted treatment. *Canadian Journal of Public Health*. 2010;101:210-2.

**Public Health Ontario's
Evidence Review for Adverse Health Effects of Drinking Optimally Fluoridated Water (2010-2017)**

pg iii: **Disclaimer**

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence at the time of publication.

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Feeling reassured?

**Public Health Ontario's actual review
of the 2017 Bashash et al. IQ study**

["Article Review on "Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6–12 Years of Age in Mexico"](#)

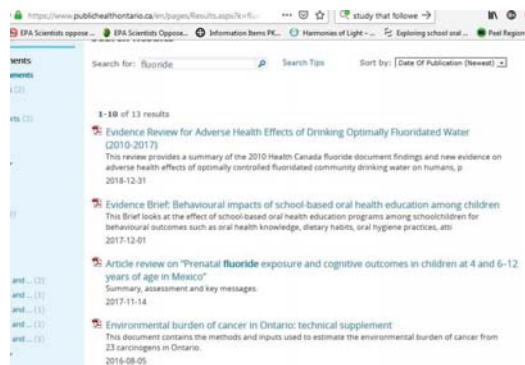
Does not contain the quote read by Dr. Ahmed.

Does contain the following, not disclosed by Dr. Ahmed:

"Previous research in the area of fluoride exposure and neurological outcomes during childhood has often been limited by small sample sizes and/or ecological study designs. The study by Bashash et al. is a considerable improvement over previous research..."

https://www.publichealthontario.ca/en/eRepository/Fluoride_IQ_Mexico_Article_Review_2017.pdf

Had Public Health Ontario reviewed the 2018 Bashash et al. ADHD study, at the time of the Windsor meeting?



No, according to their website

**WECHU, Dr. Ahmed, WF promoters
encourage decision makers to experiment with
developing brains & bodies of fetuses, infants, children**

[None appear to exist:](#)

- a single chronic toxicity study of the fluoridation agent HFSA
- a single double blind randomized controlled study of f'ed water
- a single observational study controlling for all potential confounding variables
- or even experimental proof that HFSA dissociates 100% in tap water as they claim

WF promoters dismiss studies that raise concern (i.e. Bashash et al.) while relying on studies of lesser quality

& encourage decision makers to conflate the absence of **perfect** studies demonstrating harm with "*proven safe with decades of research*".

**Windsor-Essex County Health Unit's
Oral Health Screening Data:
Based on a 10-30 second inspection**

Page 27:

"The "no touch" screening is done by a Registered Dental Hygienist. A ten to thirty second visual inspection of the child's mouth is conducted with the aid of a sterilized mouth mirror and a light source."

https://www.wechu.org/system/files_force/edit-resource/em-oral-health-report-2018/oral-health-2018-report-updatefinalv3.pdf?download=1

**Health Canada on Dental Fluorosis:
Caused by Fluoride Overexposure**

“a permanent hypomineralization of tooth enamel due to fluoride-induced disruption of tooth development... in people with high exposure... occurs only when exposure to fluorides happens during tooth formation”



- Guidelines for Canadian Drinking Water Quality Technical Document Fluoride, 2010:
<https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-fluoride/page-3-guidelines-canadian-drinking-water-quality-guideline-technical-document-fluoride.html#101>

Dental Fluorosis

Public Health attitude: “Not an adverse effect”;
publish fraudulent / misleading reports that hide actual prevalence



Photo Source: Dr. Hardy Limeback, BSc, PhD (Biochemistry), DDS, former Head, Preventative Dentistry, University of Toronto (18 years), Former President, Canadian Association for Dental Research, author and editor a textbook in preventive dentistry (Comprehensive Preventive Dentistry – Wiley-Blackwell, June 2012), chosen to serve on the National Academy of Science's committee that produced the 2006 report Fluoride in Drinking Water.

**WECHU’s Oral Health Report 2018:
Misleading/fraudulent report of dental fluorosis**

Appendix B, page 44:

“Fluorosis (a cosmetic alteration of the appearance of the tooth enamel) is associated only with areas that have exceeded the recommended concentration of fluoride in the drinking water.”

Executive Summary, page 8:

“Between 2011/2012 and the 2016/2017 school year, there were no instances of moderate or severe fluorosis in children screened. “

Table 8, page 29:

Fluorosis Index – moderate or severe fluorosis* (%)	0	0	0	0	0	0	0%
---	---	---	---	---	---	---	----

Source: Oral Health Information Support System [2011-2017], Ministry of Health and Long-Term Care (Accessed April 17, 2018).

*At school entry (kindergarten).

Dr. Hardy Limeback, BSc, PhD (Biochemistry), DDS

- Former Head, Preventative Dentistry, University of Toronto (18 years)
- Former President, Canadian Association for Dental Research
- Author & editor of a textbook in preventive dentistry (Comprehensive Preventive Dentistry – Wiley-Blackwell, June 2012)
- Chosen to serve on the National Academy of Science’s committee that produced the 2006 report *Fluoride in Drinking Water*.

**Comment from Dr. Limeback
re: WECHU's report on dental fluorosis**

"Ask Dr. Ahmed and WECHU why would they say there was no dental fluorosis when at kindergarten age there are no permanent teeth to look at??"

Tables 7 & 8 show clearly that they missed all expected dental fluorosis by looking at children only at age of school entry.

Everyone in the rest of the world looks at age 12 to 16 for dental fluorosis in permanent teeth.

There was no attempt to look at kids at that age for fluorosis.

Are they passing off looking at primary teeth as being the same as permanent teeth (which have not shown up yet)?"

**Comment from Dr. Limeback
re: WECHU's report on dental fluorosis**

"Studies in the US were all done on healthy kids.

When you look at kids who have protein or calcium deficiency (outside the US) there was lots of moderate and severe fluorosis at low levels of fluoride, including 0.7 ppm.

There are plenty of kids in Windsor Essex county who are poor and likely with low nutrition."

**Comment from Dr. Limeback
re: WECHU's report on dental fluorosis**

"Please show them this graph showing prevalence of severe enamel fluorosis by water fluoride concentration (mg/L), from our NRC report."

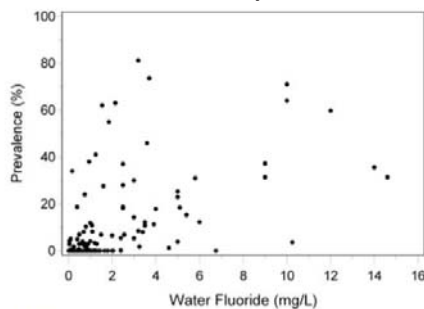


FIGURE 4-3 Prevalence of severe enamel fluorosis at the person level by water fluoride concentration, permanent teeth, age <20 years, communities outside the United States.

CDC on Children's Fluoride Exposure from Toothpaste

*Children <6 years & especially <2 years have poor control of swallowing reflex → **increased risk for dental fluorosis***

*So use **only a pea-sized bit of toothpaste***

*Supervise them and **have them spit it out***

One gram of toothpaste has approx. 1 mg of fluoride

A pea-sized bit of toothpaste is approx. 0.25 g toothpaste (and therefore contains approx. 0.25 mg fluoride)

<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm>

Problem: Fluoridated Water

In fluoridated water with 0.70 mg fluoride per litre (aka 0.7 ppm)...

...each 350 ml, or 0.35 litre, of water contains:

$0.35 \text{ L} \times 0.70 \text{ mg/L} = \mathbf{0.245 \text{ mg fluoride}}$...

...the same **dose** found in a pea-sized bit of F toothpaste that everyone agrees must be **spit out** by young children due to **increased risk of dental fluorosis**... and **call poison control** if they swallow **>0.25 mg**



**Consumed
Daily, Year after
Year, No
Warnings
Provided to the
Public**

Annual Oral Health Report



September 20, 2018

For information, please contact:

Misty Deming
Manager Oral Health
Healthy Living Division
Middlesex-London Health Unit

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Purpose

To provide information about the findings of the Health Unit's school-based dental screening program from the last school year: September 2017 to June 2018.

Methodology

Publicly funded elementary schools and private schools participated in the school-based dental screening program. Students in Junior Kindergarten, Senior Kindergarten, and Grade 2 at publicly funded schools were screened in accordance with the Oral Health Assessment and Surveillance Protocol of the Ontario Public Health Standards.

Based on the screening results of the Grade 2 students at each school, the school was categorized into the following levels of screening intensity: "Low", "Medium", or "High", as per the Protocol. Increased screening intensity level requires that additional grades be screened.

The parents of the students in these grades who decline to have their children screened advise their school administrators who then pass this information on to Health Unit staff. Children whose parents have consented to screening but who are absent on the day of screening may be screened on a subsequent screening day.

Student level data was collected by five Registered Dental Hygienists employed by the Health Unit. The need for and urgency of dental care was recorded and parents were advised during the required follow-up. As well, indicators of previous dental caries were recorded. Data was collected and stored in accordance with the Oral Health Assessment and Surveillance Protocol, the Health Protection and Promotion Act, the Municipal Freedom of Information and Protection of Privacy Act, and the Personal Health Information Protection Act.

The Ministry of Health and Long-Term Care's Oral Health Information Support System was used to generate summary statistics from the student level data. Historical aggregate data was accessed from archived Health Unit spreadsheets. These data were further analyzed using Microsoft Excel.

Key Findings

Participation. Of the 20,759 students who were offered dental screening at the schools that participated in the school-based dental screening program, 16,038 or 77% were screened (Figure 1). For the 2017-2018 school year, the Health Unit did not have parental consent to screen 3,607 (17%) students, and 1,114 (5%) were absent on the day(s) that staff were screening at their

schools. The percentage of absent and excluded students is similar to the previous year's percentage.

Screening intensity. Among the 130 elementary schools with Grade 2 in the Health Units jurisdiction, 93 (72%) were categorized as Low intensity, 17 (13%) as Medium intensity, and 20 (15%) as High intensity as per the Oral Health Assessment and Surveillance Protocol which is described in the sidebar (Figure 2).

Dental caries. The percentages of Junior Kindergarten, Senior Kindergarten, and Grade 2 students screened who were caries-free, (i.e. have never had tooth decay or the removal or filling of a tooth because of caries) were 77%, 68%, and 55%, respectively (Figure 3). These percentages are similar to the previous school year which were 77%, 68%, and 57% respectively. Two hundred and fifty-nine (7%) of Grade 2 students screened had two or more teeth with tooth decay (Figure 4).

Urgent dental needs. One thousand seven hundred and seventy-six (1776) students or 11.1% of those screened were found to have urgent dental needs which deemed them clinically eligible to receive Healthy Smiles Ontario Essential and Emergency Care funding for their dental care (Figure 5). The percentage of students found to have urgent dental needs is similar to the previous school year. To date, most students found to have urgent dental needs were referred to local dental offices for treatment. Most students began treatment, and the few cases that have not are monitored to ensure treatment begins shortly.

Next Steps

- The Health Unit will continue to increase the capacity of the school-based and daycare-based fluoride varnish programs to address the percentages of students who are caries-free.
- The Health Unit continues to work with elementary schools to promote awareness of the dental screening program and assist eligible children to enroll in the Healthy Smiles Ontario program.
- The Health Unit continues to work with Aboriginal schools and daycares to offer the dental screening and fluoride varnish programs.

Appendix A - Results

Figure 1. Number of students screened, absent and refused by school year.

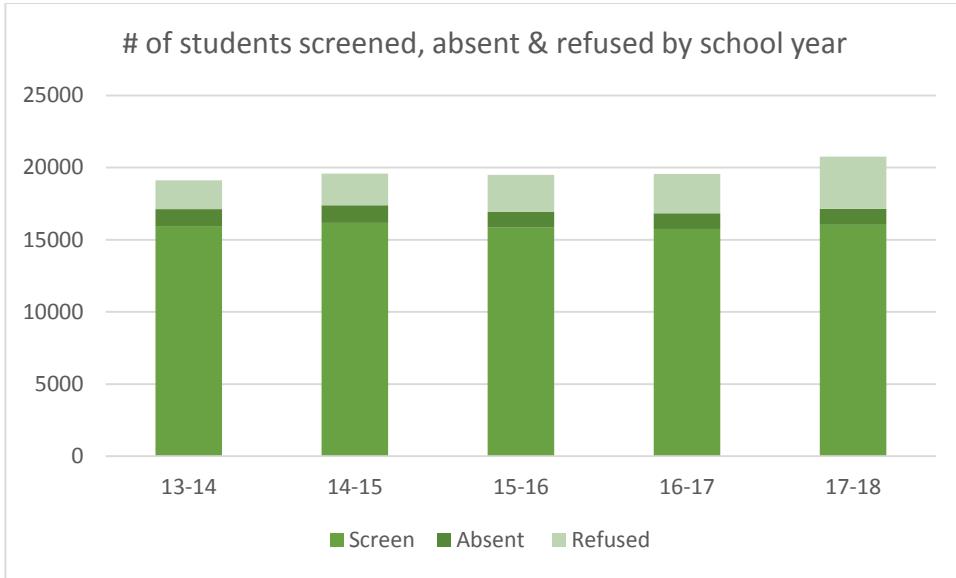


Figure 2. Screening intensity of schools by school year.

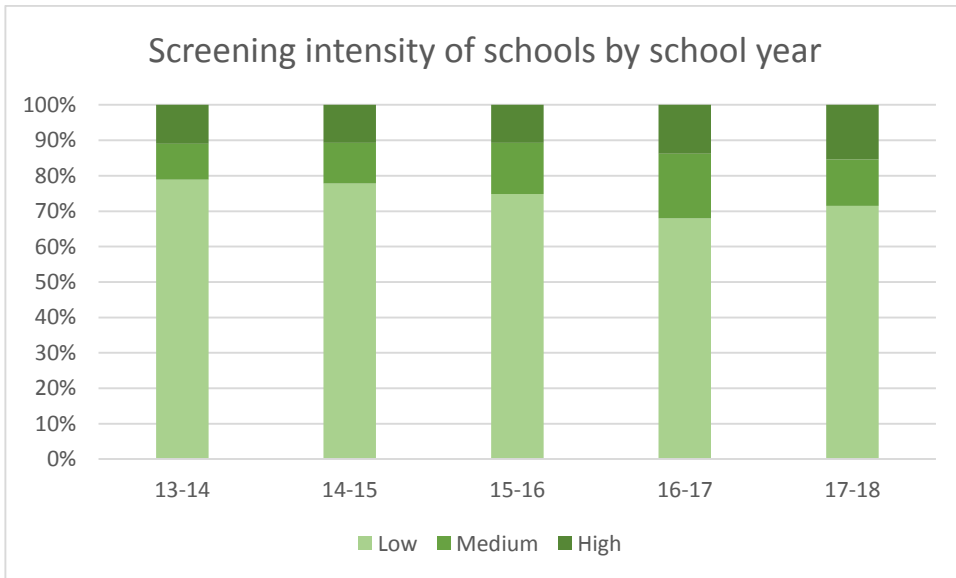


Figure 3. Percentage of students screened who were caries-free by grade.

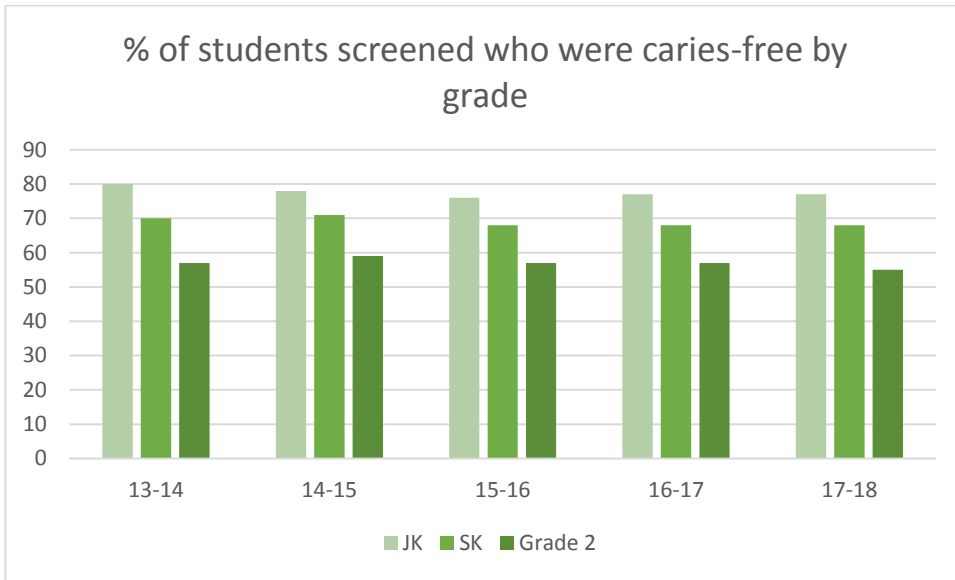


Figure 4. Number of Grade 2 students screened with two or more teeth affected by caries (decay, removals, or fillings) by school year.

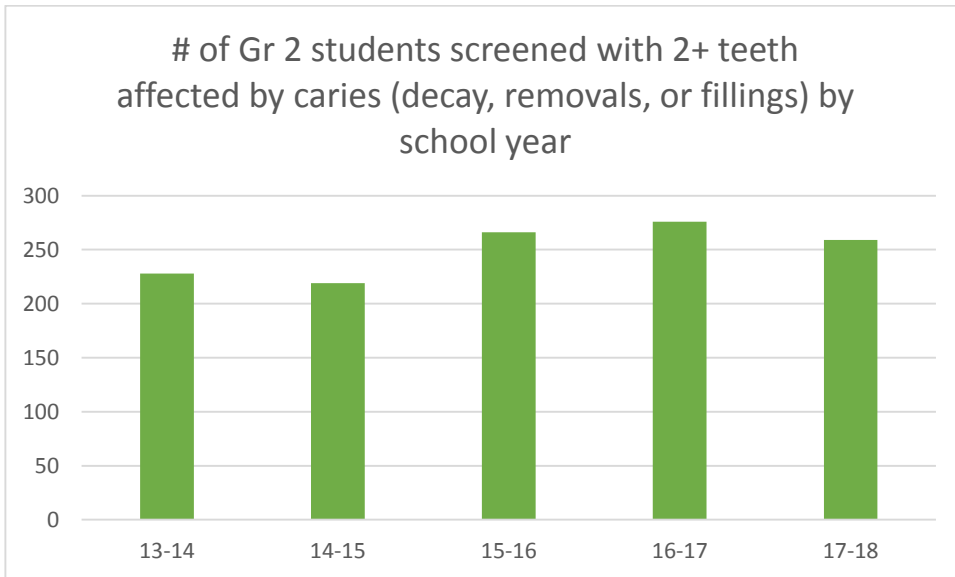
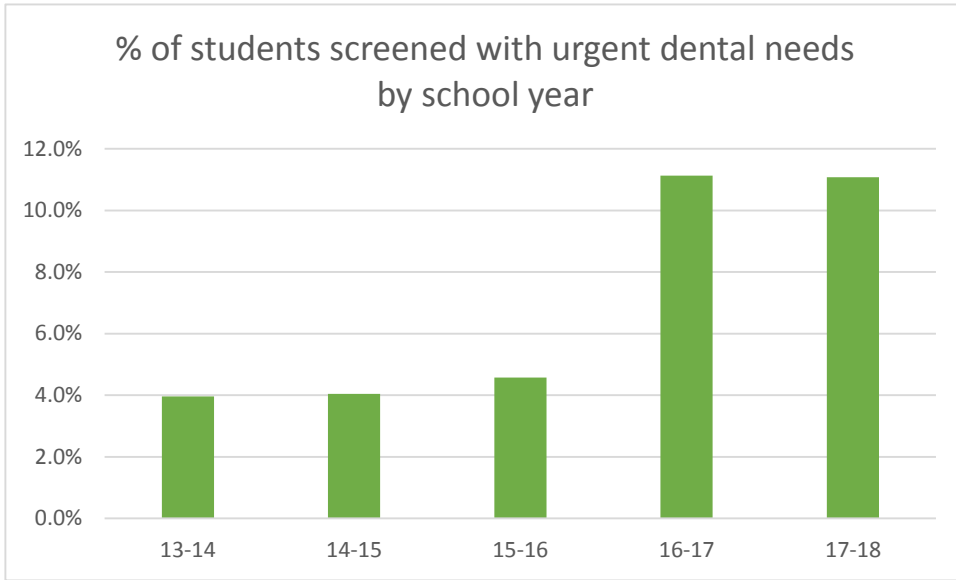


Figure 5. Percentage of students screened with urgent dental needs by school year.



Contrived and fraudulently inflated public support for water fluoridation.

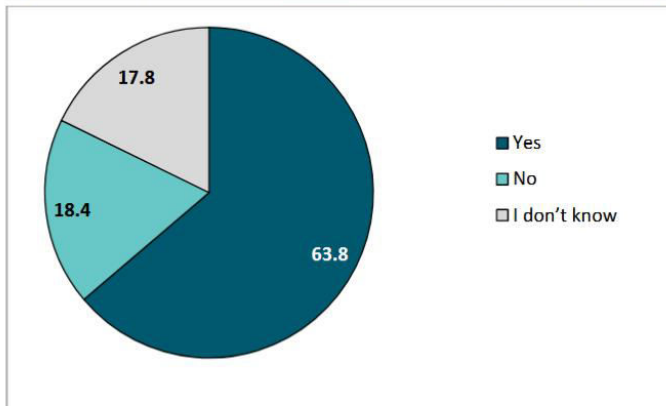
WECHU Medical Officer Dr. Ahmed highlighted during his presentation of Dec. 17 2018 to Windsor Council that *“When it comes to community water fluoridation support in Windsor and Essex every 4 out of 5 resident support community water fluoridation and this is based on 2 different study with almost 1400 residents”* (implying 80% support).

However, WECHU previously reported in their [Community Needs Assessment Full Report 2016](#) (in which they conflated contrived public support with “need”) that only *“63.8 of responders support adding fluoride to public drinking water (n =822)”*, see page 42 and 80.

[In their oral health update, WECHU inappropriately eliminated the residents who had responded *“I don’t know”* (n = 229) from the denominator and calculated a more fluoridation-friendly $63.8 / (63.8 + 18.4) = 63.8/82.2 = 0.7705$, reported as 77.6%.]

Further, WECHU withheld from respondents critical information about the serious health risks of fluoride ingestion and the unlawful nature of water fluoridation, and WECHU posed their survey question in a blatantly leading fashion: *“Do you support adding fluoride to public drinking water to help prevent tooth decay?”* See page 120 of WECHU’s full needs assessment report, for the survey wording that they do not make available on their website: http://bramptonreiki.com/wp-content/uploads/2016/11/needs_assess.pdf

Figure 36. Support for adding fluoride to public drinking water (N=1,289).



Notes: 14 participants preferred not to answer; 138 participants did not respond to this question.

Further, the RRFSS survey question was even more inappropriately leading than WECHU’s survey question; see: http://www.rfss.ca/resources/questionnaires/Water%20Fluoridation%20Support_UFQ.doc
[x](#)

Do you support or oppose adding fluoride to public drinking water when the natural amount is too low to help prevent tooth decay?

1 support

5 oppose

8 don't know

9 refused

Problem #5:

Back to the quote read by Dr. Ahmed:

warrants future studies to explore this relationship further.¹⁸ This study was critiqued by other researchers for methodological limitations including measurement error and no consideration for other potential explanatory variables (such as pre-term birth or exposure to tobacco, alcohol, arsenic or lead) apart from SES.⁴³ The results are advised to be interpreted with great caution due to high risk of ecological fallacy (water fluoridation measured at state level) and confounding bias.⁴³

- The Bashash et al. studies controlled for many potential explanatory variables besides SES
- They are not ecological studies; they measured individual level F exposure
- They did not deal with water fluoridation specifically; water is not even fluoridated in Mexico City

OPINION FOR THE CALGARY HERALD
RE: ARTIFICIAL WATER FLUORIDATION

(Word count 664)

What if our medical community was wrong once again? It has happened all too often, at times taking decades before we work through and come to grips with new facts and science, and new realities.

Recall fiascos like smoking for women, asbestos, mercury, BPA, thalidomide, Vioxx, and lead in gasoline and paint. In every instance, our medical profession avidly supported these entities. Today, it is embarrassing to believe we could have been so wrong.

Water fluoridation falls directly into this category of failed medical practices, supported by professional unions and associations for decades with weak or nonexistent evidence, buried and manipulated science, and blinded and passionate fervor to "help those poor kids". Unfortunately, the deleterious effects of fluoride mostly affect babies, children, the poor, chronically ill, elderly and people of colour.

Recently, in a Calgary Herald opinion piece, in blogs, and on radio talk shows, proponents of this failing public health practice have made egregious statements and highly misleading errors. Let's unpack a few of these.

Error # 1. "3 years after fluoridation was removed, decayed primary tooth surfaces had risen 146%".

Reality: The 2016 study by McLaren was debunked in the same journal months later. Caries also increased in fluoridated Edmonton. Almost all increase in Calgary caries were prior to 2010, while we were still fluoridated. No study has been able to definitively measure the effect of stopping fluoridation in Calgary. All cities, fluoridated or not, are experiencing increases in caries, mostly due to the prevalence of extremely high sugar and junk foods.

Error # 2. \$1 spent on fluoridation saves between \$68 and \$140 in dental care.

Reality: Calgary was going to spend ~ \$6 million in upgrades and at least \$0.7 to 1 million for annual chemicals, not including operating costs, training, staff time, maintenance, repairs, Hazmat suits, etc. After 20 years, 0.5 fillings would be saved per person (Slade et al, 2018). The \$20 to \$26 million that would be spent on fluoridation would supposedly save over \$3 BILLION in dental costs, or \$5000 per filling. This claim is clearly a huge exaggeration!

Error # 3. On a Calgary radio last week, it was stated there is "no evidence of harm at 4.0 ppm and below".

Reality: The US NRC Committee reviewed all literature and recommended to the US EPA to markedly lower the 4.0 ppm limit due to all the adverse health effects. Over 200 studies now show significant neurological trauma, and 53 of 60 of these are human studies that reveal a significant decrease in IQ in kids at fluoride levels similar to North America.

Error # 4. Dental fluorosis produced from water fluoridation is seen as mild white flecks on the teeth that can only be seen by the dentist. It does not affect the form and function of the tooth.

Reality: Dozens of peer-reviewed studies show that fluoridation produces fluorosis that is objectionable and often damaging. Prevalence has recently been shown to be much higher in a study of American children accepted for publication in a

prestigious dental journal and by the NHANES Population study that is predicting an astonishing 61% fluorosis in American teens in 2018.

Error # 5. “So many European and other countries fluoridate the salt instead”.

Reality: Only 6% of Europeans have access to fluoridated salt, and there has never been a single randomized double-blinded clinical trial (RCT) to prove fluoridated salt lowers dental decay more than toothpaste. In fact, there has never been a single RCT for any water fluoridation.

Only 5% of the world is fluoridated so Calgary is part of a huge majority that chooses not to put toxic waste from fertilizer industries of Florida and China, contaminated with arsenic, mercury and traces of other dangerous toxins, into our water. Health Canada has admitted it has no studies to prove that fluoride is safe to use in public water.

Fluoride is not necessary for a single body function.

In today’s world, when Alberta is trying to clean up our biosphere from carbon pollution, we should remain a leader in quality, fluoride free drinking water.

Dr. Hardy Limeback is a dentist and a long time fluoride researcher, with a PhD in Biochemistry. He is retired Head of Preventative Dentistry at the University of Toronto.

Dr. Robert Dickson is a family physician in NW Calgary. He is the founder of Safe Water Calgary www.safewatercalgary.com

FLUORIDATION'S NEUROTOXICITY

There is **no question** that fluoride is neurotoxic, damaging the brain and central nervous system, as documented by hundreds of studies. Extensive scientific evidence, including studies at exposures caused by fluoridated water, show it can harm children. ***It can NOT be declared safe.***



2006: The National Research Council published Fluoride in Drinking Water¹, the most authoritative review of fluoride's toxicity. It stated unequivocally that ***“fluorides have the ability to interfere with the functions of the brain and the body”*** and ***“the chief endocrine effects of fluoride include decreased thyroid function.”***

2012: A Harvard-funded meta-analysis² found that children ingesting higher levels of fluoride tested an average 7 IQ points lower in **26 out of 27 studies**. Most had higher fluoride concentrations than in U.S. water, but many had total exposures to fluoride no more than what millions of Americans receive.

“Fluoride seems to fit in with lead, mercury, and other poisons that cause chemical brain drain.”

Philippe Grandjean, MD, PhD, Harvard study co-author, Danish National Board of Health consultant, co-editor of Environmental Health, author of over 500 scientific papers

2015: A study³ covering nearly all of England found that populations drinking fluoridated water had nearly twice as high prevalence of **hypothyroidism** (low thyroid level), **known to be linked to IQ deficits**. The study's authors concluded ***“there is substantial cause for public health concern.”***

2017: A petition to EPA⁴ to end fluoridation found fluoride caused neurotoxic harm in **57 out of 61 human studies (mainly lowered IQ), several at levels in fluoridated water, and 112 out of 115 animal studies**. EPA denied the petition, triggering a lawsuit going to trial in federal court in 2019.

2017: A National Institutes of Health - funded longitudinal study⁵ in Mexico covering 13 years, one of the most robust ever done, found that every one part per million increase in fluoride in pregnant women's urine – approximately the difference caused by ingestion of fluoridated water⁶ - was associated with a reduction of their children's IQ by an average 5-6 points. Leonardo Trasande, a leading physician unaffiliated with the study, said it ***“raises serious concerns about fluoride supplementation in water.”***⁷

2018: A Canadian study⁸ representing 6.9 million people found iodine-deficient adults (nearly 18% of the population) with higher fluoride levels had a greater risk of hypothyroidism. The study's lead scientist, Ashley Malin, said ***“I have grave concerns about the health effects of fluoride exposure.”***⁹



1. <https://www.nap.edu/catalog/11571/fluoride-in-drinking-water-a-scientific-review-of-epas-standards>
2. Choi et al <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3491930/>
3. Peckham et al <http://jech.bmj.com/content/69/7/619>
4. http://fluoridealert.org/content/content-bulletin_3-1-18/
5. Bashash et al <https://ehp.niehs.nih.gov/ehp655/>
6. Till et al <https://ehp.niehs.nih.gov/doi/10.1289/EHP3546>
7. Newsweek, Sept. 19, 2017, <https://www.newsweek.com/childrens-iq-could-be-lowered-drinking-tap-water-while-pregnant-667660>
8. Malin et al <https://www.ncbi.nlm.nih.gov/pubmed/?term=till+malin+fluoride+thyroid>
9. Environmental Health News, Oct. 10, 2018, <https://www.ehn.org/we-add-it-to-drinking-water-for-our-teeth-but-is-fluoride-hurting-us-2611193177.html>

I want to say that the examination of the possible dangers of fluoridation of our water is over due. As a tax payer, consumer and parent. My family have been medicated against our will . Without our consent and without adequate consideration of side effect from long term exposure. Cause and effect are hard to prove. The cigarette lobby still claims no direct proof of cancer from cigarettes yet smoking laws do exist . We need a serious non partisan examination of the health risks from Fluoride for ALL people. Please include my concerns at the meeting.
Mike Lucas London



January 25, 2019

Civic Works Committee
300 Dufferin Avenue
London, ON
N6A 4L9

RE: Community Water Fluoridation

To the Civic Works Committee of London Council:

The London & District Dental Society (LDDS) is a local component society of the Ontario Dental Association (ODA), representing more than 400 dentists in our community. The LDDS promotes the highest standards of dental care and advocates for accessible and sustainable optimal oral health as our key priorities. On behalf of the LDDS, I am writing to advocate for the continuing optimal fluoridation of London's drinking water

The safety and effectiveness of community water fluoridation (CWF) is based on sound and compelling scientific studies, and widely supported by researchers and experts in the oral health and medical communities. The LDDS and the ODA – *along with all other stakeholders in the dental care community* – believe that optimally fluoridated water ensures the oral health, and therefore the overall health, of all Ontarians, regardless of age, socioeconomic background or geographical locationⁱ. Economic disparity should not act as a barrier to optimal oral health, and access to optimally fluoridated water is an important way to ensure fairness.

In London, the Middlesex-London Health Unit is recommending the ongoing fluoridation of the local drinking water supply due to the significant increase of children's tooth decay in jurisdictions without optimal CWF, and the need for urgent dental care. CWF is a widely successful public health measure that benefits people of all ages and backgroundsⁱⁱ, reaching large numbers of people where they live, learn, work, and play – making it more effective than any other form of fluoride deliveryⁱⁱⁱ.

Indeed, other health professional associations, including the Ontario Medical Association^{iv} and the Peel Chapter of the Registered Nurses' Association of Ontario^v, have publicly voiced their support for CWF. CWF has also been supported internationally, as the British Medical Association has publicly committed to the fluoridation of water supplies^{vi,vii}. In Ontario, CWF has received widespread support, including from former Ministers of Health and Long-Term Care and both former and current Medical Officers of Health across the province. Health professionals widely agree that CWF benefits everyone, especially those without access to regular dental care^{viii}.

CWF is an important preventative measure in maintaining the oral health and overall health for all without prejudice. In a systematic review of CWF studies, Cochrane (a world-renowned scientific research review

organization), concluded that water fluoridation is effective at reducing levels of tooth decay among children^{ix}. The consensus of the scientific community is that water fluoridation, at the level recommended to prevent tooth decay, safely provides oral health benefits which in turn supports *improved general health*^x. Additionally, the cost of prevention is far less than of treatment. For every dollar spent fluoridating the community water supply, the U.S. Centers for Disease Control and Prevention estimates that 38 dollars will be saved in dental costs^{xi}.

There is no doubt that CWF is a fiscally responsible, safe, and effective means to prevent tooth decay. For the benefit of all your constituents, we encourage you to continue to listen to the evidence-based advice of the Chief Medical Officer of Health, and other scientific and medical experts regarding the safety, importance, and effectiveness of CWF^{xii}.

Sincerely,



Dr. Michael Gross
President
London & District Dental Society

ⁱ McLaren, L., Emery Herbert, J.C. 2012. Drinking Water Fluoridation and Oral Health Inequities in Canadian Children. *Canadian Journal of Public Health*. Available at: <http://journal.cpha.ca/index.php/cjph/article/viewFile/2974/2636>.

ⁱⁱ Armfield, Jason Mathew. "Community effectiveness of public water fluoridation in reducing children's dental disease" *Public health reports (Washington, D.C. : 1974)* vol. 125,5 (2010): 655-64.

ⁱⁱⁱ Institute for Science in Medicine. *Community Water Fluoridation Policy Statement*, p. 2. Available at <https://www.scienceinmedicine.org/policy/statements/fluoridation.pdf>

^{iv} Ontario Medical Association. 2010. *Water Fluoridation*. Available at: <https://www.oma.org/HealthPromotion/Pages/Fluoridation.aspx>.

^v Brampton Guardian. 2016. *Nurses Support Water Fluoridation*. Available at: <http://www.bramptonguardian.com/opinion-story/6274582-nurses-support-water-fluoridation/>.

^{vi} British Medical Association. 2009. *Fluoridation of Water*. Available at:

http://bmaopac.hosted.exlibrisgroup.com/exlibris/aleph/a21_1/apache_media/VMYPT7FHYYI9TMH8V36U7PBQULMHQ9.pdf.

^{vii} British Medical Association. 2014. *No evidence of fluoridation health risks, says report*. Available at: <http://www.bma.org.uk/news-views-analysis/news/2014/march/no-evidence-of-fluoridation-health-risks-says-report>.

^{viii} McGrady MG, Ellwood RP, Maguire A, Goodwin M, Boothman N, Pretty IA. (2012). The association between social deprivation and the prevalence and severity of dental caries and fluorosis in populations with and without water fluoridation. *BMC Public Health* 2012;12:1122-39

^{ix} Iheozor-Ejiofor Z, Worthington HV, Walsh T, O'Malley L, Clarkson JE, Macey R, Alam R, Tugwell P, Welch V, Glenny A. *Water Fluoridation for the Prevention of Dental Caries*. Cochrane Database of Systematic Reviews 2015, Issue 6. Available at: http://www.cochrane.org/CD010856/ORAL_water-fluoridation-prevent-tooth-decay.

^x American Dental Association, *Fluoridation Facts*, 2018. P. 38.

^{xi} Centers for Disease Control and Prevention. 2013. *Cost Savings of Community Water Fluoridation*. Available at: <http://www.cdc.gov/fluoridation/factsheets/cost.htm>.

^{xii} Ontario's Chief Medical Officer of Health. 2012. *Oral Health – More Than Just Cavities*. Available at: http://www.health.gov.on.ca/en/common/ministry/publications/reports/oral_health/oral_health.aspx.

From: Ayesha Drouillard

Sent: Sunday, February 03, 2019 3:47 PM

To: Saunders, Cathy <csaunder@london.ca>; CWC <cwc@london.ca>

Cc: City of London, Mayor <mayor@london.ca>; van Holst, Michael <mvanholst@london.ca>; Lewis, Shawn <slewis@london.ca>; Salih, Mo Mohamed <msalih@london.ca>; Helmer, Jesse <jhelmer@london.ca>; Cassidy, Maureen <mcassidy@london.ca>; Squire, Phil <psquire@london.ca>; Morgan, Josh <joshmorgan@london.ca>; Lehman, Steve <slehman@london.ca>; Hopkins, Anna <ahopkins@london.ca>; Van Meerbergen, Paul <pvanmeerbergen@london.ca>; Turner, Stephen <sturner@london.ca>; Peloza, Elizabeth <epeloza@london.ca>; Kayabaga, Arielle <akayabaga@london.ca>; Hillier, Steven <shillier@london.ca>

Subject: safe water- Attention Civic Works Committee

Dear Decision Makers,

I'm writing to you today mostly because I'm concerned for my parents who have been drinking fluoridated water, here in London, for over 35 years. I'm worried because the known effects of ingesting hydrofluorosilicic acid, a bio-accumulative toxin, are becoming apparent in their health.

I would like this correspondence to be on record, please add this letter to the agenda.

It's very sad, unfair and unnecessary. Did you know that Montreal and Vancouver have NEVER fluoridated? So many thriving, progressive and vibrant cities do NOT fluoridate their public water supply:

We are in good company!
Here are just some of the fabulous cities across the globe who choose water free of fluoride:

Vancouver	Montreal	Portland
Paris	Rome	Berlin
Venice	Athens	Reykjavik
Moscow	Brussels	Tokyo
Vienna	Budapest	Helsinki
Amsterdam	Geneva	Quebec City
Hong Kong	Niagara Falls	Oslo
Guelph	Thunder Bay	The Hague

More and more communities are discontinuing fluoridation as they come to realize that no studies have proven that fluoride is safe for everyone, especially our infants, pregnant women, those with thyroid and kidney impairments, diabetics and people with compromised immune systems. Here are just some of those communities:

These are just some of the North American communities who have stopped adding fluoridation chemicals to their water since 1999:

Niagra Region, ON	Whitehorse, Yukon	West Elgin, ON
Portland, Oregon	Santa Fe, New Mexico	Quebec City, Quebec
Muskoka, ON	Okotos, Alberta	Tottenham, ON
Juneau, Alaska	Saint John, New Brunswick	Cobalt, ON
Moncton, New Brunswick	Amherstburg, ON	Lake of Bays, ON
Wichita, Kansas	Huntsville, ON	Dutton-Dunwich, ON
Waterloo, ON	Erie, Pennsylvania	Honolulu, Hawaii
Dryden, ON	Cornwall, ON	Orillia, ON
Salt Lake City, Utah	Parry Sound, ON	Dieppe, New Brunswick
Kirkland Lake, ON	Albany, New York	Santa Cruz, California
Spokane, Washington	Clearwater, Florida	Calgary, Alberta
Churchill, Manitoba	Santa Barbara, California	Flagstaff, Arizona

There have been no new fluoride schemes since 1999.

Please watch this beautiful 20 minute informative short film, directed and produced by documentary filmmaker Jeremy Seifert:

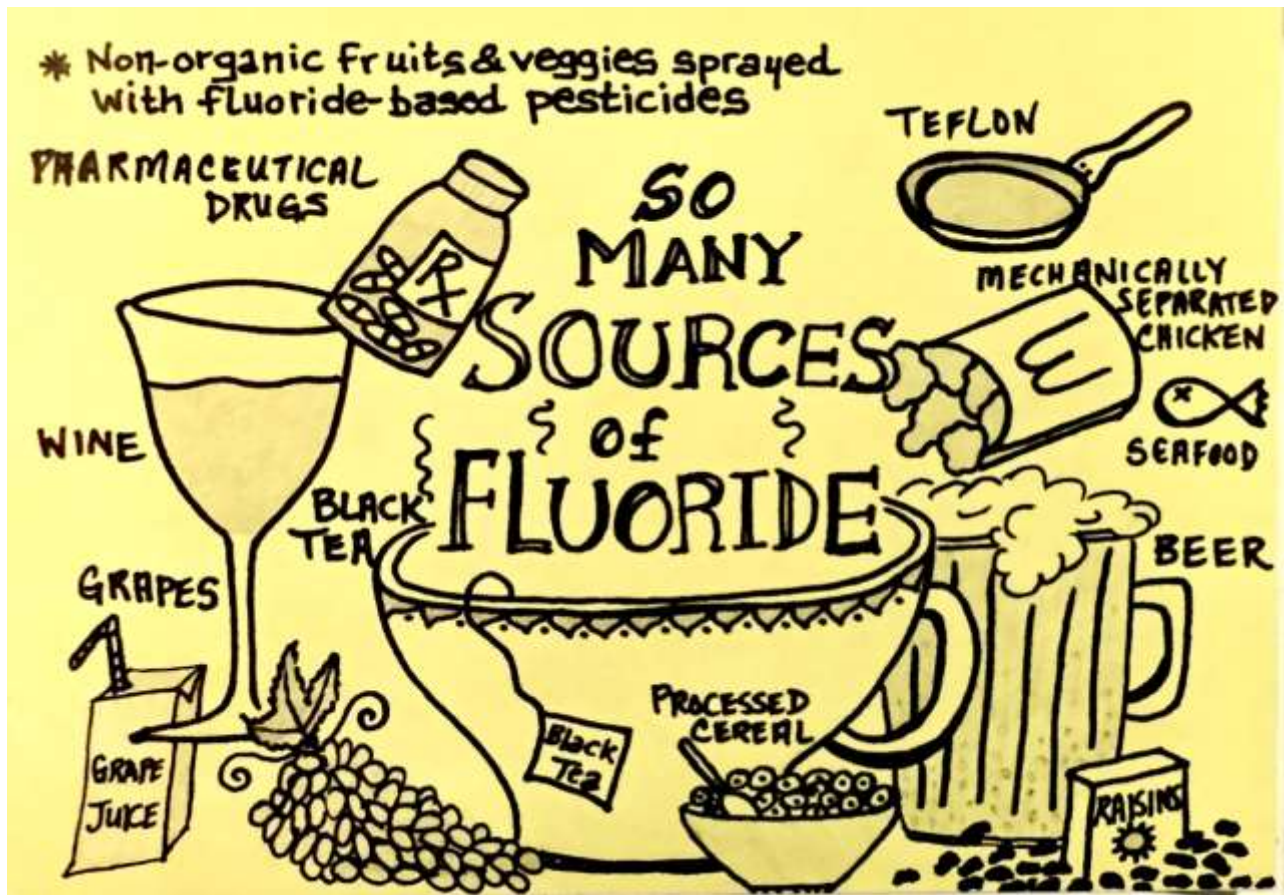
<https://m.youtube.com/watch?v=2mUUrZJaHPU>

This is what the International Academy of Oral Medicine and Toxicology has to say about fluoridation:

<https://iaomt.org/resources/fluoride-facts/>

They provide scientific resources to support new levels of integrity and safety in healthcare. The work of IAOMT is crucial because there's an alarming lack of professional, policy maker, and public awareness about dangerous dental products that are harming humans and the environment on a massive scale.

Besides toothpaste, there are so many other sources of fluoride that it's hot hard to be overexposed, since dose is based on thirst and there is no individual monitoring.



It's so easy for formula-fed infants to be over-exposed. I hope each water bill will have a warning to warn parents and caregivers not to mix formula with fluoridated tapwater. They need to be aware that bottle fed babies are the most at risk. Fluoride cannot be boiled out, in fact, boiling only concentrates it.

- Babies bottle fed with fluoridated water receive a HUGE dose of fluoride compared to breast fed babies. Even if the mother is consuming fluoridated water, her body filters it out of her breastmilk.

Breastmilk contains 0.004 ppm, this means bottle fed babies receive roughly 200 times more fluoride than a breast fed baby. And babies do not even have teeth!

Is the city going to pay for safe water for low-income families who cannot breastfeed? All these places already have warnings:

National Research Council In March 2006, the National Research Council (NRC) cautioned that infants can fluoride-overdose via reconstituted baby formula. (2) The American Dental Association (ADA) passed this information on to its members in a November 2006 e-gram.

Vermont Department of Health:

“The Vermont Department of Health recommends mixing powdered or concentrated baby formula with water that is fluoride-free, or contains very low levels of fluoride, for feeding infants under 12 months of age. Recent studies have discovered the possibility that infants in this age group may be consuming more fluoride than necessary.”

<http://healthvermont.gov/news/2006/120806fluoride.aspx>

New York State Department of Health

“Parents who are concerned about the risk of enamel fluorosis, can mix liquid concentrate or powdered infant formula with water that is fluoride free or contains low levels of fluoride. Examples are water that is labeled purified, demineralized, deionized, distilled or reverse osmosis filtered water.”

http://www.health.ny.gov/prevention/dental/fluoride_guidance_during_infancy.htm

California Dental Association

“...mixing powdered or liquid infant formula concentrate with fluoridated water on a regular basis for infants primarily fed in this way may increase the chance of a child’s developing enamel fluorosis,”

according to the CDA’s Feb 2010 Report, Oral Health During Pregnancy and Early Childhood: Evidence-Based Guidelines for Health Professionals. http://www.cdafoundation.org/library/docs/poh_guidelines.pdf
(Page 12)

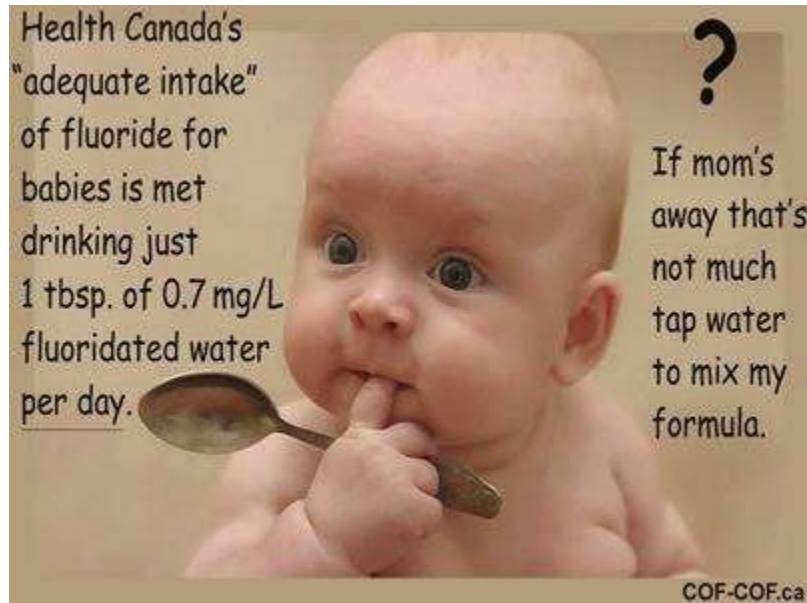
Des Moines Water Works

Powdered or liquid concentrate infant formula can be mixed with water that is fluoride free or contains low levels of fluoride. These types of water are labeled as purified, demineralized, deionized, distilled or reverse osmosis filtered water. <http://www.dmww.com/upl/documents/water-quality/lab-reports/fact-sheets/fluoride.pdf>

American Dental Association_Evidence-based_Infant_Formula_Chairside_Guide.

Recommendations for infants who consume reconstituted infant formula as the main source of nutrition: • Continue use of liquid or powdered concentrate infant formulas reconstituted with optimally fluoridated drinking water while being cognizant of the potential risk for enamel

fluorosis. • Use ready-to-feed formula or liquid or powdered concentrate formula reconstituted with water that is either fluoride-free or has low concentrations of fluoride when the potential risk for enamel fluorosis is a concern. http://ebd.ada.org/contentdocs/ADA_Evidence-based_Infant_Formula_Chairside_Guide.pdf



Our pets already get fluoride from dog and cat food. The Environmental Working Group put out a paper in 2009 revealing high levels in various brands of pet foods. Also having it in their drinking water is too much. Does your pet suffer from symptoms of arthritis? Studies link fluoride overexposure to skeletal fluorosis (over-accumulation of fluoride in the bones) and osteosarcoma (bone cancer). Let's protect our fur-babies!

<https://vitalanimal.com/fluoride/>

<https://www.ewg.org/research/dog-food-comparison-shows-high-fluoride-levels>



Please consider this very important decision carefully and do not be misled by the questionable claims of your perceived health authorities who's job is to promote and endorse fluoridation. They are NOT toxicology or environmental experts. My family does NOT consent to this violation of our human rights to safe water. This has been going on for too long, we know better now, and you have the power to finally stop this nonsense.

Thank you for your time,
Respectfully,

The Saleem Family

As stated by Dr. Peter Mansfield, a physician from the UK and advisory board member of the recent government review of fluoridation (*McDonagh et al 2000*):

“No physician in his right senses would prescribe for a person he has never met, whose medical history he does not know, a substance which is intended to create bodily change, with the advice: ‘Take as much as you like, but you will take it for the rest of your life because some children suffer from tooth decay. ‘ It is a preposterous notion.”

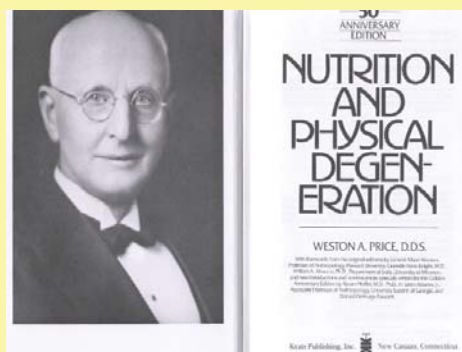
NUTRITION AND PHYSICAL DEGENERATION

SUMMARIZING THE WORK OF
DR. WESTON A. PRICE
www.westonaprice.org

Read Dr. Price's Book for Free Here:
<http://gutenberg.net.au/ebooks02/0200251h.html>

Cavities Are NOT Caused By A Fluoride Deficiency!

Presented by Pam Killeen, London, ON
pam@pamkilleen.com



To watch my presentation about the work of Dr. Weston A. Price, be sure to watch the following video from the Public Participation Meeting, Jan 25, 2012 --
<https://vimeo.com/297583383>

To read more about the history of how Artificial Water Fluoridation (AWF) came to be, be sure to read the following article -- <https://www.westonaprice.org/health-topics/dentistry/nutrition-fluoridation-and-dental-health/>

AWF is a Fundamentally Flawed Practice

- There's an enormous disconnect between the alleged benefits of artificial water fluoridation (AWF) and genuine science ...
- In fact, there hasn't even been a safety study done on the fluoride chemical, HFSA, that is added to our city water.

The Fluoride ion is **not** an essential nutrient

1. The following organizations all agree that fluoride is **not** an essential nutrient:

National Research Council
National Academy of Sciences
British Medical Journal
Food & Drug Administration

2. There is no such thing as "fluoride deficiency."
3. There is not one biochemical process in the human body that needs fluoride to function properly

<http://fluoridealert.org/studies/essential-nutrient/>

With AWF, 85% of Children Develop Cavities

“For every hundred kids in our community, 15 of them don’t have to have their teeth filled EVER because they drink fluoridated water.”

Dr. Bryna Warshawsky, former associate medical officer of health, London-Middlesex County

CJBK interview, March 10, 2011

There is No Debate

When asked (at the Public Participation Meeting, January 25, 2012) if it’s better to ingest fluoride or apply it topically, Dr. Warshawsky replies:

“The main effect from fluoride is a *topical* effect.”

CDC, MMWR, 48(41); 933-940, Oct 22, 1999

- “...laboratory and epidemiologic research suggest that ... its actions primarily are *topical*...”

As such, there is no need to add it to our drinking water.

At the same meeting, a local London dentist, Dr. Jeffrey Richmond, was touting the alleged benefits of artificial water fluoridation. He showed the following slides of two of his pediatric patients. These children live in London, ON, a fluoridated community. How is it possible that a health professional can tout the benefits of artificial water fluoridation, and not see that this medication isn’t working? These children are consuming fluoridated water, and just look at the amount of dental problems they’re experiencing!



Where was Health Canada to Help Warn us of the Health Hazards Associated with Smoking?

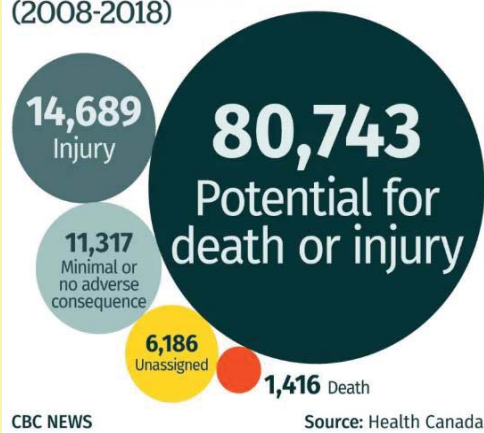
- 1920s: Reports linking cigarette smoking with cancer. [Back then, Health Canada was known as the Department of Health. In 1993, the Department of Health became known as Health Canada.]
- 1954: Canadian Medical Association issues first public warning on the hazards of smoking.
- 1963: Canada's Minister of National Health and Welfare, Judy LaMarsh, declared that "There is scientific evidence that cigarette smoking is a contributory cause of lung cancer and that it may also be associated with chronic bronchitis and coronary heart disease."
- In 1972, the first **voluntary** warning appeared on the side of packages
- By 1989, under the Tobacco Products Control Act, it was **mandatory** for packets to have a health warning. Health Canada was not a party to this. Nor was it ever negotiated with Health Canada.

The 4th Leading Cause of Death = Properly Prescribed Drugs (Approved by Health Canada)

- There are an estimated 200,000 severe Adverse Drug Reactions (ADRs) in Canada each year, though it is estimated that 95% of ADRs are not reported.
- They cost the Canadian healthcare system between \$13.7 and \$17.7 billion each year and kill up to 22,000 Canadians each year. Over 5,000 of these are Canadian children.

Adverse Drug Reaction Canada

Domestic medical device incidents reported to Health Canada (2008-2018)



These defective medical devices were approved by Health Canada.

NOTE: Health Canada is not doing this research. Instead, they are assuming that industry funded research is truthful and accurate.

Lies, Damned Lies, and Medical Science

- Much of what medical researchers conclude in their studies is misleading, exaggerated, or flat-out wrong. So why are doctors—to a striking extent—still drawing upon misinformation in their everyday practice? **Dr. John Ioannidis** has spent his career challenging his peers by exposing their bad science.
- "... as much as **90 percent** of the published medical information that doctors rely on is flawed."

DAVID H. FREEDMAN
NOVEMBER 2010 ISSUE

<https://www.theatlantic.com/magazine/archive/2010/11/lies-damned-lies-and-medical-science/308269/>

- Also: Why Most Published Research Findings Are False
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1182327/>

What's the Next Step?

- Request to present the fluoridation issue to go before the Strategic Priorities and Policy Committee (SPPC).

Extra Slides

Monsanto Accused of Attempt to Bribe Health Canada for rBGH (Posilac) Approval

Return to [Monsanto Investing News](#) web page.

[Excerpted The Ottawa Citizen, Fri 23 Oct 1998, Page A1, by James Bastes]

Scientists 'pressured' to approve cattle drug: Health Canada researchers accuse firm of bribery in bid to OK 'questionable' product

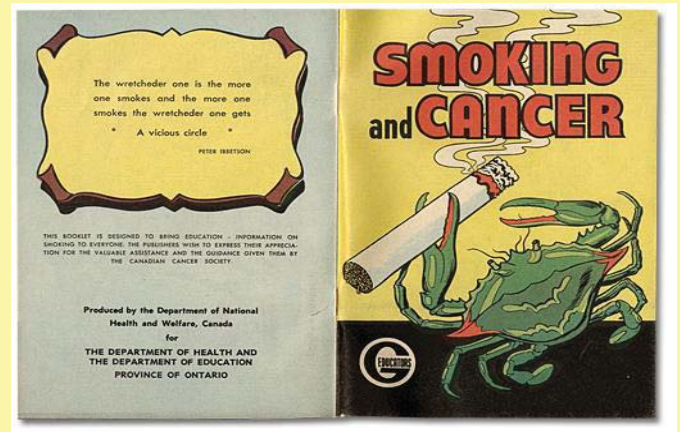
Veterinary scientists from Health Canada's Human Safety Division testified yesterday that they are being pressured to approve a controversial hormone intended to boost milk production in dairy cattle. "We have been pressured and coerced to pass drugs of questionable safety, including rBST," Dr. Shiv Chopra told the Senate Standing Committee on Agriculture and Forestry.

The senators sat dumbfounded as Dr. Margaret Haydon told of being in a meeting when officials from Monsanto Inc., the drug's manufacturer, made an offer of between \$1 million and \$2 million to the scientists from Health Canada -- an offer that she told the senators could only have been interpreted as a bribe.

Dr. Haydon also recounted how notes and files critical of scientific data provided by Monsanto were stolen from a locked filing cabinet in her office. Dr. Chopra said that all files pertaining to rBST are now controlled by one senior bureaucrat and can only be viewed by gaining permission. "I can't even believe I'm in Canada when I hear that your files have been stolen and that all the files are now in the hands of one person," said Senator Eugene Whelan. "What the hell kind of a system have we got here?"



1963



Because Our Health Regulators Have Been Asleep at the Wheel

- Smoking is responsible for a devastating healthcare burden in Canada, according to a Conference Board of Canada study published today. The study says that smoking causes more than 45,000 deaths in Canada annually, which is nearly 1 in 5 of all deaths (18.4%) in the country. Smoking also causes a massive \$6.5 billion in direct health care costs and \$16.2 billion in total economic costs, including healthcare costs.

Canadian Cancer Society
16 October 2017

Guilty As Charged ...

- Tobacco companies have paid more than \$100 billion to state governments as part of the 25-year, \$246 billion settlement. And, this is just in the US.
- Note: Unlike smoking, we can't see, smell or taste fluoride. So, it's been easier for consumers to be complacent on this issue. But that doesn't make fluoride any less toxic.

Health Canada Makes Mistakes ...

Government of Canada / Gouvernement du Canada

Search Canada.ca

Home → Departments and agencies → Health Canada → Services

Thalidomide Survivors Contribution Program

From Health Canada

This program is intended to help meet the lifetime needs of Canadian thalidomide survivors. It is being delivered by Crawford & Company Canada (also known as Crawford), an independent third-party service provider. Crawford is responsible for:

- delivering ongoing support payments
- managing the Extraordinary Medical Assistance Fund (EMAF)
 - this fund will pay for specialized surgery, home and vehicle adjustments to accommodate survivor disabilities
- assessing and re-assessing the health status of thalidomide survivors
- determining the eligibility of people who identify themselves as survivors of thalidomide

OPINION

Have we forgotten the lessons of the tainted blood scandal?

ANDRÉ PICARD
PUBLISHED NOVEMBER 28, 2017
11 COMMENTS

Twenty years ago, on Nov. 26, 1997, the [final report](#) of the Commission of Inquiry on the Blood System in Canada was made public.

TRENDING

1
With Trudeau's decision to fire McCallum, Canada's relations with China have now hit rock bottom

- The regulator, Health Canada, did little independent verification of the safety of blood products, trusting the Red Cross claim that only one in one million blood donations were contaminated. That number was a fabrication;
- The provinces, who funded the Red Cross for collecting blood and distributing blood products, were largely hands off and indifferent to safety;
- When the severity of the blood scandal began to become clear, the committee overseeing funding of the blood system shredded all its documents.

CBC | MENU

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Manufacturer restricts use of diabetes drug Avandia

The Canadian Press | Posted: Nov 07, 2007 4:41 PM ET | Last Updated: November 7, 2007

The manufacturer of a drug for treating Type 2 diabetes has placed new restrictions on use of the medication based on a Health Canada review of clinical data pointing to an increased risk of heart-related problems in some patients.

GlaxoSmithKline Inc., in consultation with Health Canada, is updating prescribing information on products made from or containing the drug rosiglitazone: Avandia, Avandamet and AvandarylTM.

Once touted as the gold standard for preventing Type 2 diabetes in high-risk patients, rosiglitazone lost its glitter after a study published in the New England Journal of Medicine in May showed Avandia significantly raised the risk of heart attack and possible death.

The NEJM analysis of 42 studies revealed a 43 per cent higher risk of heart attack for those taking rosiglitazone compared to people taking other diabetes drugs or no diabetes medication at all.

Recalls and safety alerts

Canada

Recalls & alerts | Kids | Food | Your Health | Environment | Consumer products

Home → Recalls & alerts

ESSURE (permanent birth control system) - Risk of Serious Complications

Starting date: May 30, 2016
Posting date: May 31, 2016
Type of communication: Dear Healthcare Professional Letter
Subcategory: Medical Device
Source of recall: Health Canada
Issue: Important Safety Information
Audience: Healthcare Professionals, General Public
Identification number: RA-58538

Report a Concern

Key messages

- Complications have been reported with the use of ESSURE (permanent birth control system). These include changes in menstrual bleeding, unintended pregnancy, chronic pain, perforation and migration of device, allergy and sensitivity or immune-type reactions. Some complications may be considered serious.
- In some patients, these complications have led to the surgical removal of ESSURE, which may include hysterectomy.
- To help ensure that healthcare professionals and patients have a clear understanding of how ESSURE works and the risks involved with ESSURE, Bayer HealthCare LLC in collaboration with Health Canada is developing a Patient Information Sheet and Checklist intended to be reviewed and signed prior to the use of the device.
- The product labelling for ESSURE will be updated including a new Boxed Warning section to reflect this safety information.
- ESSURE users should be aware of the potential complications and seek medical advice if necessary.

Breast-implant-related complications, including cancer, kept secret thanks to broken reporting system

By **ROBERT CRIBB** Investigative Reporter
JESSE MCLEAN Investigative Reporter
Thu., Nov. 29, 2018

When Health Canada and the U.S. Food and Drug Administration allowed silicone implants back onto the market in 2006, the message was clear: any health risks from breast implants were minor and “widely understood,” FDA statements say.

That confidence was reaffirmed in the small number of reported incidents in the “adverse events” databases of both countries. In Canada, there were no more than a handful year to year dating back to the early 1990s, according to Health Canada data obtained through access to information requests and analyzed for the first time.

It is clear now the figures — and the reassuring portrait they painted — were wrong.

They did not reflect the growing number of women removing their implants, the stories of rupture, pain, illness and cancer threats or diagnoses, and the tens of thousands around the world who joined Facebook groups to share their experiences.

THE IMPLANT FILES

Insulin pumps linked to more reports of injury and death than any other medical device, records show



Convenient device requires patient training to be effective and safe, doctor says

Valérie Ouellet, Vik Adhopia, Andrew Culbert - CBC News -
Posted: Nov 27, 2018 4:00 AM ET | Last Updated: November 30, 2018

Health Canada 'ill-equipped' to investigate

Ontario's Mary Krueger says **Health Canada** has a knowledge gap of its own when it comes to insulin pumps.

Hernia mesh complications may have affected up to 170 000 patients, investigation finds

BMJ 2018 ; 362 doi: <https://doi.org/10.1136/bmj.k4104> (Published 27 September 2018)
Cite this as: BMJ 2018;362:k4104

[Article](#) [Related content](#) [Metrics](#) [Responses](#)

Jacqui Wise

Up to 170 000 patients who have had hernia mesh operations in the past six years could be experiencing complications, yet NHS trusts in England have no consistent policy for treatment or follow-up with patients, an investigation by the BBC's *Victoria Derbyshire* programme has found.

THE IMPLANT FILES

'We're guinea pigs': Canada's oversight process for implanted medical devices stuns suffering patients



Onus is on manufacturers, not doctors or hospitals, to report problems and patient complaints to Health Canada

Valérie Ouellet, Vik Adhopia, David McKie - CBC News -
Posted: Nov 25, 2018 12:00 PM ET | Last Updated: November 26, 2018

An analysis of Health Canada data obtained through Access to Information also reveals that in the past 10 years, devices such as replacement hips, insulin pumps and pacemakers are suspected to have played a role in more than 14,000 reported injuries and 1,416 deaths.

Fluoride ion is not a nutrient

1. There is no such thing as “fluoride deficiency.”
2. There is not one biochemical process in the human body that needs fluoride to function properly
3. Fluoride and the teeth. Topically (i.e. externally) fluoride hardens the enamel and makes it more resistant to acid attack, but internally it interferes with enamel formation (dental fluorosis)

Health Canada Makes Mistakes

Health Canada's Troubling Relationship With For-Profit Plasma Collection

As the public regulator responsible for the nation's health, it is the well-being of Canadians that should come first, not the bottom line of private enterprise.

01/09/2018 16:46 EST | Updated 01/09/2018 16:55 EST

Essure, a contraceptive available in Canada, under scrutiny in U.S.

The FDA is looking at claims of scary side effects associated with the device, which is approved by Health Canada.

by Sarah Boesveld Updated Aug 9, 2016

'Listen to the women'

Hill is one of 184 women in Quebec, Ontario and Saskatchewan who are part of a class-action lawsuit that alleges the spring-like device led to major complications. Regina-based Tony Merchant's lawsuit is going through the certification process.

Hill said she's speaking out because she wants to help protect other women from the pain and suffering she experienced.

"I am very disappointed in Health Canada. I believe they need to do their homework. They need to listen to the women."

June 5, 2014

Liesa Cianchino
1213 Clarkson Rd. N.
Mississauga, ON L5J 2W1

RE: Artificial Water Fluoridation

Dear Members of Regional Council:

I am writing to you on behalf of the Concerned Residents of Peel, a group that is dedicated to ending the artificial fluoridation of Peel's drinking water. We respectfully request that this letter be added to the June 12, 2014 Agenda.

Since April 28, 2011, the Concerned Residents of Peel have made delegations to Regional Council and have articulated urgent concerns related to the safety and the lawfulness of the chemical additives used to fluoridate our drinking water.

For decades now, all levels of Government, Public Health Officials, Dental Associations and many other organizations have unconditionally re-assured Regional Council Members and residents that community water fluoridation is both safe and effective.

Over the past few years we continued to highlight our serious concerns related to artificial water fluoridation with respect to the many adverse health effects and risks; the mass medication of the entire Region; the lack of informed consent; and the potential illegality of the Region's fluoridation program, including the *Clean Water Act 2006*, which empowers communities to take action to prevent threats from becoming significant.

During these past few years a growing body of new scientific research has been published in leading peer-reviewed scientific and medical journals, which corroborate our position on these issues.

In this submission we draw your attention to some major legal challenges that need to be addressed before this Council can legally continue the current fluoridation program. The public has the right to know and the right to get the answers.

- Health Canada has, instead of attending a round table discussion with members of Regional Council, concerned residents and experts chose to answer written questions on Behalf of The Concerned Residents of Peel, Dr. Hardy Limeback and a Member of Council, supplied answers that were, after analysis, including legal analysis, false and or misleading.
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region is recognized legally as being a toxic and a hazardous product by the Hazardous Products Act 2010, listed in its First Priority Substances List as part of the 40 most toxic substances and defined as such in at least 8 other Federal and Provincial laws or regulations.
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region has NOT been legally approved as a substance to prevent dental decay, that is, by legal definition, a drug or a natural health product, by Health Canada or by the US FDA.
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region contravenes the Food and Drug Act when added to water which is unfit for human consumption by its toxic nature, its unhygienic as manufactured, packaged, transported and stored in uncontrolled sanitary conditions required by the «Good

Manufacturing Practices» (GMP).

- Health Canada, the Ministry of Health, the Public Health Agency and many Municipal Councils are misrepresented by health authorities with a «bait and switch» practice that has attributed, to the fluoridation chemicals, functions that their nature and their legal classifications does NOT legally permit.
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region is NOT of Pharmaceutical or Food Grade, they are Industrial Grade as labelled «For Industrial Use Only». «Shall NOT be used as food».
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region is NOT abiding the *United States Pharmacopeia* (USP) standard or its equivalent for its identification, strength, quality and purity and are NOT manufactured in the required and strict conditions of the «Good Manufacturing Practices» (GMP).
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region is produced in facilities that are NOT subjected to «Good Manufacturing Practices» (GMP).
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region according to Health Canada's own statement does NOT fall under its jurisdiction, which excludes Hydrofluorosilicic Acid of being legally a drug, a natural health product, a mineral for food fortification, a food additive or plainly a food, excluding by definition any therapeutic or nutritional function of preventing dental decay.
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region, despite the fact that its real nature and its legal classification render it improper for the purpose aimed and claimed by its addition to drinking water, as it is added solely for a therapeutic purpose of preventing and reducing dental decay by modifying the composition and the function of a tissue in human beings, that is by legal definition a purpose and an allegation that can only be attributed to a drug or a natural health product.
- The Hydrofluorosilicic Acid used as its fluoridating chemicals by Peel Region can NOT be legally a water treatment chemical because it does NOT treat the water as water treatment chemicals, thus, it can NOT be legally used for preventive therapeutic purpose without contravening the Food and Drug Act.
- Health Canada claims that fluoridating agents are nothing more than water treatment chemicals and that medical, dental, dental hygienist and pharmaceutical professional boards have absolutely NO legal qualification to take a stand on fluoridation as water treatment chemicals are NOT a part of their training, scope of practice or curriculum, thereby, these professionals can NOT be called experts on fluoridation or take a stand on it.
- Fluoridation water treatment chemicals, if used in a municipality, must legally comply with the NSF Standard 60 and be certified as such, which requires Toxicological Studies that would demonstrate safety.
- Health Canada, the Ministry of Health, the Public Health Agencies, the EPA, and the CDC were NOT able to supply the required Toxicological Studies that would demonstrate the safety of the fluoridating water treatment chemicals.

The addition of water treatment chemicals, that do NOT meet the legal NSF Standard 60 requisite of a review of Toxicology Studies proving its safety, even if a false certificate has been delivered for these substances, it will NOT legally discharge any member of Peel Regional Council of their liability.

Adding a product for the primary purpose to treat preventively a disease called dental decay with water treatment chemicals:

- that do NOT meet legal certification requirements,
- that safety has NOT been proven by Toxicological Studies,
- that is unregulated, uncontrolled and untested by Health Canada for its therapeutic or nutritional uses,
- that are legally defined as hazardous chemicals, that are unhygienic by its unsanitary conditions of manufacturing, packaging, transporting and storing,
- that are produced in facilities that are NOT subjected to «Good Manufacturing Practices»,
- that are administered to all residents (patients) without informed consent, thereby, given the above facts, would seriously subject members of this Council to liability and even to potential criminal charges.

Council has been alerted numerous times on the new legislation in Ontario's *Safe Drinking Water Act, 2002, Section 19*, now includes a broader statutory standard of care for individuals who have oversight responsibilities for municipal drinking water systems that extend to our municipal Councillors.

We respectfully ask that you **re-open the Fluoridation issue and afford our Lawyer, and some key experts if required an opportunity to make a presentation on the key findings and arguments in order that you are fully informed of the implications to Council Members, staff and the Corporation of Peel.**

For the record, we have asked numerous times for the Toxicology Studies to verify the safety of the Hydrofluorosilic Acid used to fluoridate the Region of Peel's drinking water and to date, none have been provided.

We trust that you now have a greater appreciation and understanding as to the reasons why we need to take immediate action to stop artificial water fluoridation because it is unsafe, upoven, unethical, unnatural and unnecessary.

In closing, on behalf of **your** Concerned Residents of Peel, **we urge you, our elected Members of Council, to take immediate action and direct staff to stop adding the toxic chemical additive in question, Hydrofluorosilicic Acid, to Peel's water supply until this Council and the Concerned Residents of Peel receive the Toxicological Studies to prove safety for human consumption.**

Respectively Submitted By:

Liesa Cianchino

On Behalf of the Concerned Residents of Peel

Founding Member of the World Wide Alliance to End Fluoridation

Special Thanks to:

Dr. Gilles Parent ND

Co-author of "Fluoridation: Autopsy of a Scientific Error"

Water Fluoridation: Health Concerns

Paul Connett, PhD

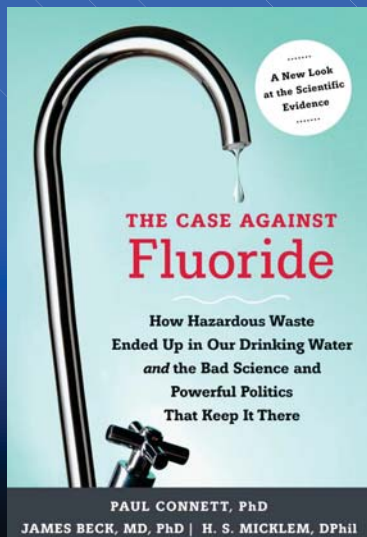
Senior Adviser,
Fluoride Action Network

FluorideALERT.org

Brampton, Ontario,

Jan 21, 2016

- I have spent the last 20 years researching **fluoride's toxicity and the policy of water fluoridation** first as a professor of chemistry specializing in **environmental chemistry and toxicology**, and then as director of the **Fluoride Action Network (2000-2015)**.
- Much of this research effort was summarized in a book ***The Case Against Fluoride***



Book published by Chelsea Green

October, 2010

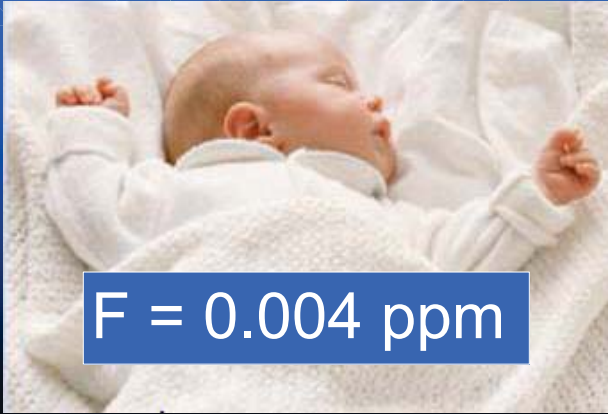
Can be ordered on Amazon.com

Contains 80 pages of references to the Scientific literature

Outline of my presentation

1. Mothers' milk protects babies from fluoride
2. The evidence that Fluoride is NEUROTOXIC
3. There is no adequate margin of safety to protect all children drinking fluoridated water from lowered IQ
4. More evidence of harm to the brain
5. Why a drop of a few IQ points at the individual level is so serious at the population level
6. Three Questions for Councillors

1. Mothers' milk protects our babies from early exposure to fluoride



F = 0.004 ppm

Water fluoridation removes nature's protection if babies are bottle-fed with fluoridated water



F = 1.00 ppm
250 x level in mothers' milk

2)

The evidence that fluoride is **NEUROTOXIC**

The evidence that fluoride is **NEUROTOXIC** is very strong:

See

www.FluorideACTION.net/issues/health/brain

Evidence that Fluoride is neurotoxic

- **Over 100 animal studies** show that prolonged exposure to fluoride can damage the brain
- **49 human studies** link modest-high fluoride exposures with lowered IQ
- **34 animal studies** show rodents exposed to fluoride have an impaired capacity to learn and/or remember
- **12 studies** (7 human, 5 animal) link fluoride with neurobehavioral deficits
- **3 human studies** show fluoride impacts the fetal brain

34 out of 36 Animal Studies Have Found Fluoride Impairs Learning/Memory



FLUORIDEALERT.ORG
Fluoride Action Network

IQ studies – the current tally

- **49** out of **56** studies have found an association exposure to fluoride and lowered IQ (China, India, Mexico and Iran)

FLUORIDEALERT.ORG
Fluoride Action Network

Xiang et al. (2003 a,b)

- Compared IQ of children in two villages:
- Low Fluoride Village Average F in well water = **0.36 ppm** (Range = 0.18 -0.76 ppm)
- High Fluoride Village Average F in well water = **2.5 ppm** (Range 0.57 – 4.5 ppm)
- **Controlled for lead exposure** and **iodine intake**, and retrospectively for **arsenic**
- Found a drop of 5-10 IQ points across the whole age range between the two villages

Xiang et al. (2003 a,b)

MALES

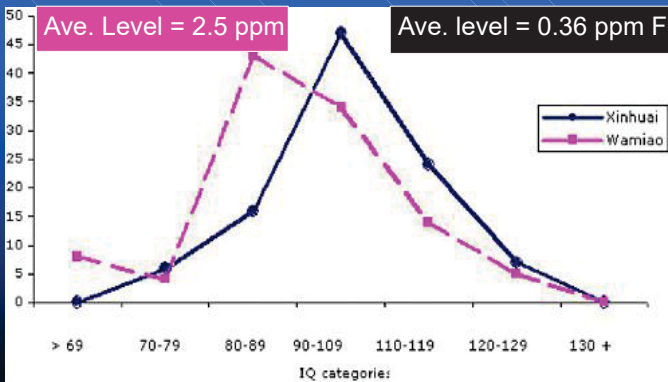


Table 8. Level of fluoride in drinking water and children's IQs

Village	Group	No. sample	F in drinking water (mg/L)		IQ and rate of retardation	
			Water F level (Mean±SD)	No. children	IQ (Mean±SD)	Rate of IQ<80 (%)
Xinhui	F	290	0.36±0.15	290	100.41±13.21	6.55
Wamiao	A	9	0.75±0.14	9	99.56±14.13	0.00
	B	42	1.53±0.27	42	95.21±12.22*	9.52
	C	111	2.46±0.30	111	92.19±12.98†	14.41*
	D	52	3.28±0.25	52	89.88±11.98†	21.15†
	E	8	4.16±0.22	8	78.38±12.68†	37.50†

*p<0.05. †p <0.01 compared with group F.

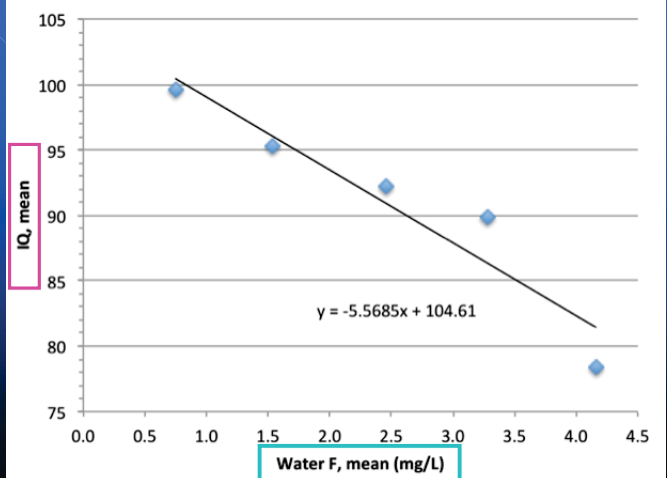
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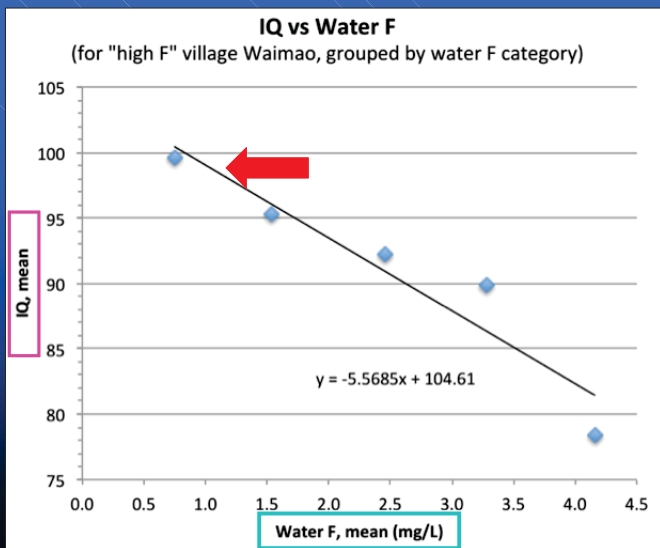
Village	Group	No. sample	F in drinking water (mg/L)		No. children	IQ and rate of retardation	
			Water F level (Mean±SD)	Water F level (Mean±SD)		IQ (Mean±SD)	Rate of IQ<80 (%)
Xinhui	F	290	0.36±0.15	0.36±0.15	290	100.41±13.21	6.55
Wamiao	A	9	0.75±0.14	0.75±0.14	9	99.56±14.13	0.00
	B	42	1.53±0.27	1.53±0.27	42	95.21±12.22*	9.52
	C	111	2.46±0.30	2.46±0.30	111	92.19±12.98†	14.41*
	D	52	3.28±0.25	3.28±0.25	52	89.88±11.98†	21.15†
	E	8	4.16±0.22	4.16±0.22	8	78.38±12.68†	37.50†

*p<0.05. †p <0.01 compared with group F.

IQ vs Water F

(for "high F" village Wamiao, grouped by water F category)





This data would suggest that IQ is lowered somewhere between 0.75 and 1.5 ppm

Moreover, in two respects these Chinese children had LESS exposure from other sources than US children: 1) they were probably breast-fed not bottle-fed and 2) they didn't use Fluoridated toothpaste

The Harvard Meta-analysis

- In 2012, Choi et al (the team included Philippe Grandjean) published a meta-analysis of 27 studies comparing IQ in "high" versus "low" fluoride villages

Harvard Meta-analysis of IQ studies

Review

Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis

Anna L. Choi,¹ Guifan Sun,² Ying Zhang,³ and Philippe Grandjean^{1,4}

¹Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts, USA; ²School of Public Health, China Medical University, Shenyang, China; ³School of Stomatology, China Medical University, Shenyang, China; ⁴Institute of Public Health, University of Southern Denmark, Odense, Denmark

BACKGROUND: Although fluoride may cause neurotoxicity in animal models and acute fluoride poisoning causes neurotoxicity in adults, very little is known of its effects on children's neurodevelopment.

OBJECTIVE: We performed a systematic review and meta-analysis of published studies to investigate the effects of increased fluoride exposure and delayed neurobehavioral development.

METHODS: We searched the MEDLINE, EMBASE, Water Resources Abstracts, and TOXNET databases through 2011 for eligible studies. We also searched the China National Knowledge Infrastructure (CNKI) database, because many studies on fluoride neurotoxicity have been published in Chinese journals only. In total, we identified 27 eligible epidemiological studies with high and reference exposures, and points of IQ scores, or related cognitive function measures with means and variances for the two exposure groups. Using random-effects models, we estimated the standardized mean difference between exposed and reference groups across all studies. We conducted sensitivity analyses restricted to studies using the same outcome assessment and having drinking-

Registry 2003). Fluoride exposure to the developing brain, which is much more susceptible to injury caused by toxicants than is the mature brain, may possibly lead to permanent damage (Grandjean and Landrigan 2006). In response to the recommendation of the NRC (2006), the U.S. Department of Health and Human Services (DHHS) and the U.S. EPA recently announced that DHHS is proposing to change the recommended level of fluoride in drinking water to 0.7 mg/L from the currently recommended range of 0.7–1.2 mg/L, and the U.S. EPA is reviewing the maximum amount of

Environmental Health Perspectives,
2012 Oct;120(10):1362-8.

Harvard meta-analysis of 27 studies

- The Harvard team acknowledged that there were weaknesses in many of the studies, however, **they stressed that the results were remarkably consistent**
- In **26 of the 27 studies** average IQ in the “high fluoride” village was lowered by **about 7 IQ points**

Fluoridation proponents have argued that the concentrations in the “high” fluoride villages were not relevant to water fluoridation in the US.

They are wrong!

Author/year	ppm in High F village
Chen 1991	4.55
Lin 1991	0.88
An 1992	2.1 – 7.6 (mean = 4.9)
Xu 1994	1.8
Yang 1994	2.97
Li 1995	1.81 – 2.69 (mean = 2.25)
Yao 1996	2 – 11 (mean = 6.5)
Zhao 1996	4.12
Yao 1997	2
Lu 2000	3.15
Hang 2001	2.90
Wang 2001	2.97
Xiang 2003	0.57 – 4.5 (mean = 2.54)
Seraj 2006	2.5
Wang 2006	5.44 +/- 3.88 (1.52 – 9.32)
Fan 2007	1.14 – 6.09 (mean = 3.62)
Wang 2007	3.8 – 11.5 (mean = 7.65)
Li 2010	2.47 +/- 0.75 (1.72 – 3.22)
Poureslami 2011	2.38
Wang 1996	>1- 8.6 (mean = 4.8)

Mean of 20 results (using means) = 70.49 / 20 = 3.52

Taken from Choi et al, 2012 – Table 1, pp 24-26.

- The mean of these 20 studies is LOWER than the EPA's safe drinking water standard (4 ppm)
- And, in several studies the High F village is less than 3 ppm

IQ studies with water F concentration below 3 mg/L in "higher F group", and with statistically significant results

Study	IQ point difference	Water F concentration "high F group" (mg/L)
Xu et al. 1994	-14.0	1.8
Yao et al. 1997	-6.5	2
Hong et al. 2001	-6.6	2.90
Seraj et al. 2006	-13.4	2.5
Poureslami et al. 2011	-6.2	2.38

- Fluoridation promoters focus on the highest levels where IQ lowered
- But in order to protect the whole population regulatory toxicologists look for the lowest levels where harm is found!

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Taken from Choi et al, 2012 – Table 1, pp 24-26.

The Xiang (2003) data would suggest that IQ is lowered somewhere between 0.75 and 1.5 ppm

3)

There is no adequate margin of safety to protect all our children from lowered IQ



Dr. William Hirzy, a former risk assessment specialist at US EPA, has used standard risk assessment procedures to calculate a **safe level of fluoride that would protect all children against lowered IQ** and this is exceeded in the US even before consuming fluoridated water!

There is certainly NO MARGIN OF SAFETY to protect the brains of ALL children exposed to fluoride in the US or Canada from a combination of water fluoridation and other sources.

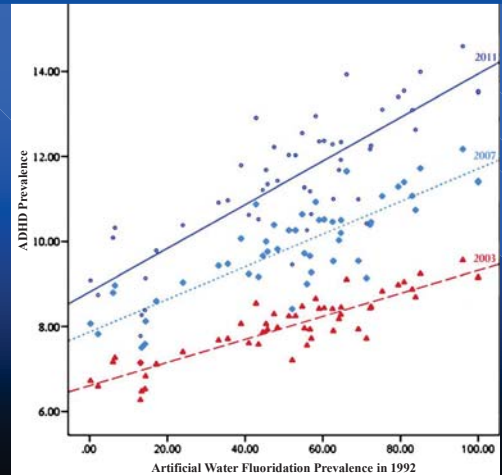
The very last children who need a loss of IQ points are children from **low-income families**, who are precisely the children targeted in water fluoridation programs!

4)
But it is not just lowered IQ that is of concern.

A recent Canadian study found an association between the prevalence of ADHD in the USA with fluoridation

A J Malin and C Till, (2015). “Exposure to fluoridated water and attention deficit hyperactivity disorder prevalence among children and adolescents in the United States: anecological association.” *Environmental Health* (2015) 14:17

Percent of children with ADHD (by state) for 2003, 2007 and 2011 plotted against the % of population in each state fluoridated in 1992



The Lancet (2014)

- In 2014, in the prestigious medical journal *The Lancet*, Landrigan and Grandjean cited the Harvard meta-analysis to support their conclusion that fluoride is one of only 11 chemicals that is known to damage the developing brain.

The Lancet (2014)

- “Our very great concern is that children worldwide are being exposed to unrecognized toxic chemicals that are silently eroding intelligence, disrupting behaviors, truncating future achievements, and damaging societies...” **Landrigan and Grandjean**

Dr. Philippe Grandjean

“Fluoride seems to fit in with lead, mercury, and other poisons that cause chemical brain drain.” (Harvard Press Release)

An incredible double standard

US and Canadian health agencies have been aggressively reducing exposure of children to lead,

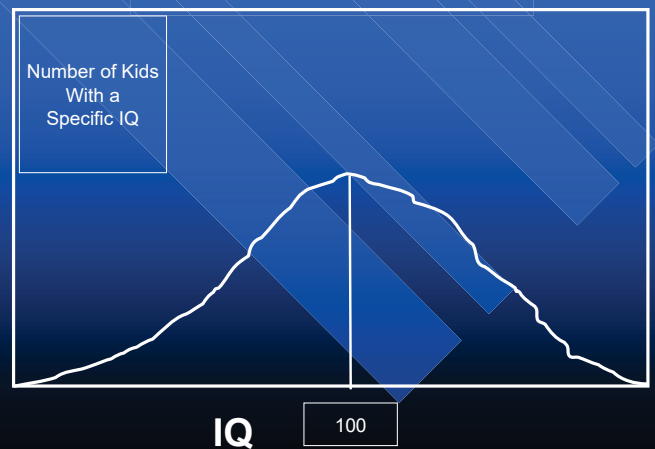
because IT IS NEUROTOXIC

BUT they continue to allow fluoride to be DELIBERATELY added to their drinking water even though there is strong evidence it is NEUROTOXIC!

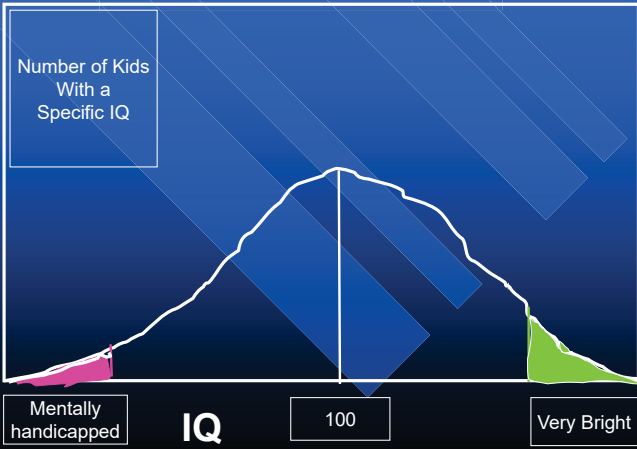
5)

Why a small loss of IQ at the individual level is very serious at the population level

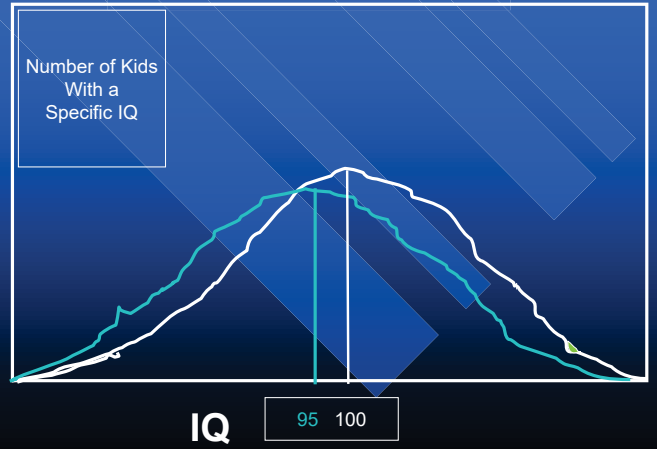
IQ and population



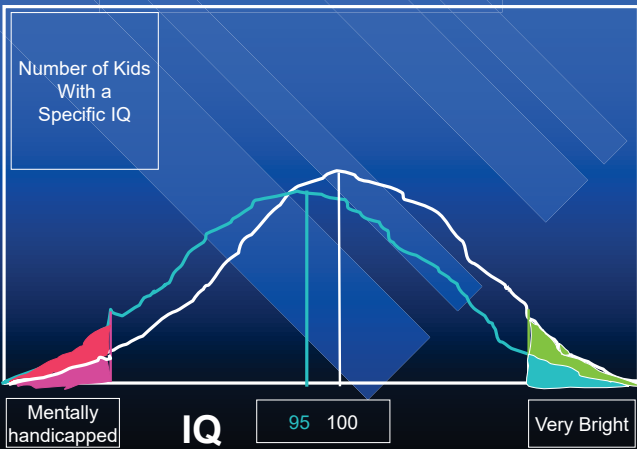
IQ and population



IQ and population



IQ and population



6)

Three key questions
for councillors

1) Have the promoters of this practice convinced you that they have strong scientific evidence (i.e. not opinion but primary studies) that allows them and you to confidently ignore all the evidence of fluoride's neurotoxicity?

2) How can they claim (and you accept) that fluoridation is "safe" if they cannot show that there is AN ADEQUATE MARGIN OF SAFETY to protect ALL our children from lowered IQ or other neurological effects?

3) Why are proponents of fluoridation prepared to take such serious risks when a) the evidence that swallowing fluoride lowers tooth decay is very weak and b) there are alternative approaches to fighting tooth decay (practiced in many other countries) which don't force fluoride on people who don't want it?

EXTRA SLIDES

A note on endorsements

1. Proponents use a long list of endorsements from government agencies and professional bodies that claim that fluoridation is “safe and effective”
2. But these endorsements date back to the 1950s and were made when there was virtually no science on the table
3. All they represent today is how difficult it is for bureaucracies to change their minds once they have adopted something as a “policy.” When ‘Policy’ is king, science becomes a slave!

Endorsements

4. In short, for many dental bodies fluoridation has become a “belief” system which is extremely resistant to new scientific evidence
5. Note also that these endorsements have not impressed the vast majority of the countries that do not fluoridate their water – including 97% of Europe

Beware of “reviews” conducted by pro-fluoridation governments

These are usually conducted by hand-picked panels with a majority already pro-fluoridation. The results are predictable and self-serving. Examples:

The 1991 DHHS review

The 2002 Irish Fluoridation Forum

The 2007 Australian NHMRC review

The 2011 Health Canada Review

Beware of “reviews” conducted by pro-fluoridation governments

In the case of the 2011 Health Canada Review, they relied on a panel of six experts – 4 of which were dentists and well-known to be pro-fluoridation and one known to be one of the most avid promoters of fluoridation in the USA (Jay Kumar)!

7) Other countries have shown that there are better ways of fighting tooth decay in children from low-income families

Scotland

- Instead of water fluoridation, the Scottish Government has a **ChildSmile** program, which:
 - a) teaches toothbrushing in nursery-schools;
 - b) provides healthy snacks & drinks in school;
 - c) provides dental health and dietary advice to both children and parents, and
 - d) provides annual dental check-ups and treatment if required including fluoride varnish applications.

ChildSmile results

- The proportion of children aged 4–6 years without obvious dental decay has risen from **42% in 1996** to **67% in 2012**.
 - The proportion of children aged 10–12 years without obvious dental decay rose from **53% in 2005** to **73% in 2013**
- (Information Services Division Scotland, 2013).

ChildSmile Cost savings

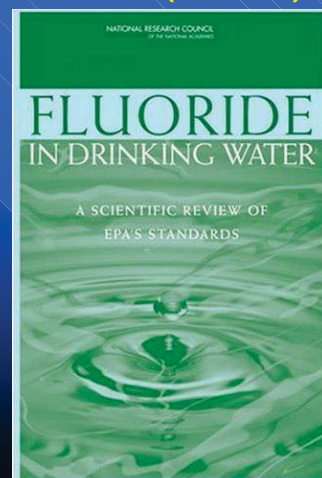
- *“Glasgow researchers found that the scheme had reduced the cost of treating dental disease in five-year-olds by more than half between 2001 and 2010.” (BBC, Scotland)*

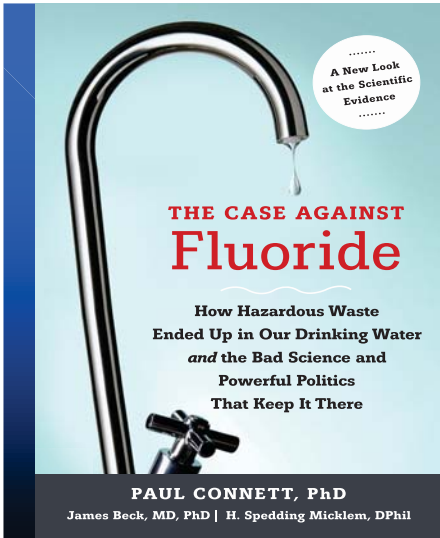
- In short our kids need
- MORE BRUSHING!
- MORE FRUIT AND VEGETABLES!
- LESS SUGAR!
- Less sugar means less tooth decay and less OBESITY
- Less obesity means less diabetes and fewer heart attacks
- In other words education to promote less sugar consumption is a very good investment!

We need
EDUCATION
not **FLUORIDATION**
to fight tooth decay and
obesity.

RESOURCES

NRC (2006)





Book published
by Chelsea Green

October, 2010

Can be ordered
on Amazon.com

Contains
80 pages
of references
to the
Scientific
literature

See Also

“50 Reasons to Oppose Water
Fluoridation”

Can be viewed ONLINE at
www.FluorideACTION.net

See the 28 minute DVD

“Professional Perspectives on
Water Fluoridation”

www.FluorideACTION.net

See the

20 minute DVD

“TEN FACTS on FLUORIDE”
PLUS BOOKLET

at

www.FluorideACTION.net

See the 46 minute TV debate
between Professor Paul Connett
and Dr. Richard Kahn on
NJ Educational TV (May, 2015)
<http://fluoridealert.org/fan-tv/fluoridation-debate-paul-connett-fan-exec-director-vs-richard-kahn-past-president-of-nj-dental-association/>

EXTRA SLIDES for possible
questions from the panel

After 70 years there has been
NO individual, Randomized
Controlled Trial (RCT) for
water fluoridation!

Fluoridation proponents are
misleading when they
give decay savings as
RELATIVE savings expressed as
a PERCENTAGE rather than
ABSOLUTE savings in terms of
teeth or surfaces

Recent Trends in Dental Caries in U.S. Children and the Effect of Water Fluoridation

J.A. BRUNELLE and J.P. CARLOS

Epidemiology Branch, National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland 20892

The decline in dental caries in U.S. schoolchildren, first observed nationwide in 1979-1980, was confirmed further by a second national epidemiological survey completed in 1987. Mean DMFS scores in persons aged 5-17 years had decreased about 36% during the interval, and, in 1987, approximately 50% of children were caries-free in the permanent dentition.

Children who had always been exposed to community water fluoridation had mean DMFS scores about 18% lower than those who had never lived in fluoridated communities. When some of the "background" effect of topical fluoride was controlled, this difference increased to 25%. The results suggest that water fluoridation has played a dominant role in the decline in caries and must continue to be a major prevention methodology.

J Dent Res 69(Spec Iss):723-727, February, 1990

J. DENT. RES. 69, 723-727 (1990)

Presented at a Joint IADR/ORCA International Symposium on Fluorides: Mechanisms of Action and Recommendations for Use, held March 21-24, 1989, Callaway Gardens Conference Center, Pine Mountain, Georgia

NIDR survey: Brunelle & Carlos (1990)

- This was the largest survey of tooth decay ever carried out in the US. NIDR looked at 39,000 children in 84 communities.
- In Table 6 Brunelle and Carlos compared tooth decay of children who had spent all their lives in a Fluoridated Community with those who had spent all their lives in a Non-Fluoridated one

NIDR survey: Brunelle & Carlos (1990)

- Their measure of tooth decay was **Decayed Missing and Filled Surfaces (DMFS)** of the permanent teeth.

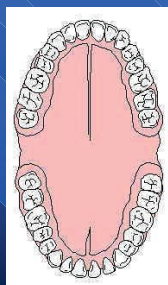
Brunelle and Carlos (1990) (Table 6)



2.8
DMFS
F

The largest US survey of tooth decay

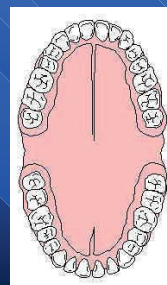
3.4
DMFS
NF



2.8
DMFS
F

Brunelle and Carlos, 1990

3.4
DMFS
NF



2.8
DMFS
F

Average **difference** (for 5 - 17 year olds) in DMFS
= 0.6 tooth surfaces

Not only was this saving very small (**0.6 of one tooth surface**) but it was not even shown to be statistically significant!

But note – if this 0.6 of one tooth surface difference is expressed as a **RELATIVE** percentage difference ...

$0.6/3.4 \times 100 = 18\%$
it sounds more impressive!

The Cochrane Review (June, 2015)

- In addition, the Cochrane review was not convinced that studies showing that water fluoridation reduces decay in children are applicable to today's society, as nearly all the studies used in calculations (dating back to the 1940's – 1960's) were conducted prior to the availability of fluoride toothpaste and other sources of fluoride which we have today, and were at high risk of bias.

Other human studies (in addition to IQ studies)

- 1) Rey-Osterrieth Complex Figure Test (ROCT), Rocha-Amador, 2009
- 2) Neurobehavioral Core Test Battery (NCTB), Yazdi, 2011 and Guo, 2011
- 3) Neonatal Behavioral Neurological Assessment (NBNA), Li, 2004
- 4) Fetal Brain Studies, Yu, 1996; Dong, 1989; Du, 1992 and Hen, 1989

UK Hypothyroidism study

UK Hypothyroidism study

Are fluoride levels in drinking water associated with hypothyroidism prevalence in England? A large observational study of GP practice data and fluoride levels in drinking water

S Peckham, D Lowery, S Spencer

Centre for Health Services Studies, University of Kent, Canterbury, Kent, UK

Correspondence to Professor Stephen Peckham, Centre for Health Services Studies, University of Kent, Canterbury, Kent CT2 7NF, UK; S.Peckham@kent.ac.uk

Received 18 September 2014
Revised 16 January 2015
Accepted 18 January 2015

ABSTRACT

Background While previous research has suggested that there is an association between fluoride ingestion and the incidence of hypothyroidism, few population level studies have been undertaken. In England, approximately 10% of the population live in areas with community fluoridation schemes and hypothyroidism prevalence can be assessed from general practice data. This observational study examines the association between levels of fluoride in water supplies with practice level hypothyroidism prevalence.

Methods We used a cross-sectional study design using secondary data to develop binary logistic regression models of predictive factors for hypothyroidism prevalence at practice level using 2012 data on fluoride levels in drinking water, 2012/2013 Quality and Outcomes Framework (QOF) diagnosed hypothyroidism prevalence data, 2013 General Practitioner registered

disorder, there are few population studies that examine the association of this disease with fluoride intake.³

In the UK, management of hypothyroidism is undertaken by primary care physicians (general practitioners, GPs) and patients' thyroid function (levels of thyroid-stimulating hormone and thyroxine) is tested annually as one element of the GP pay-for-performance system, the Quality and Outcomes Framework (QOF).⁷ These data provide a measure of practice prevalence of hypothyroidism which can be geographically mapped against areas with and without fluoride added to the drinking water. This paper examines whether fluoride levels provide a useful contribution to a predictive model of practice level hypothyroidism, and whether there is any difference in hypothyroidism prevalence between practices serving areas where water is

Region of Peel Educational Session – Artificial Water Fluoridation (AWF)

January 21, 2016

Dr. Hardy Limeback BSc, PhD DDS
Professor Emeritus, Faculty of Dentistry,
University of Toronto
Former Head, Preventive Dentistry
Practicing Dentist in Peel 1983-2015

The Debate in Peel: Artificial Water Fluoridation (AWF)

AWF Supporters make the hypothesis that:
"AWF is Safe and Effective"

"The great tragedy of Science — the slaying of a beautiful hypothesis by an ugly fact."
(TH Huxley)

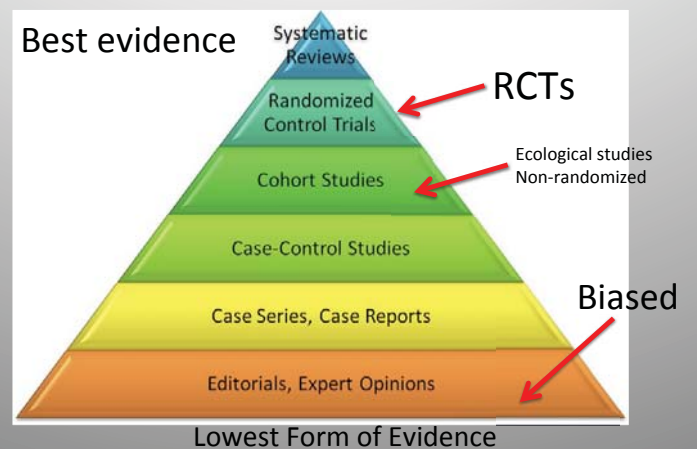
"No amount of experimentation can ever prove me right; a single experiment can prove me wrong."
(Albert Einstein)

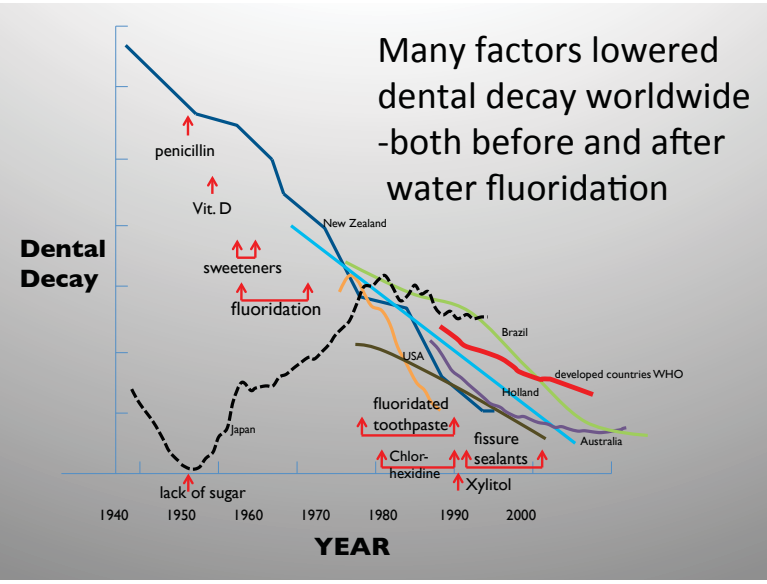
Paraphrasing Einstein and Huxley:

"No amount of evidence can ever PROVE artificial water fluoridation (AWF) to be safe and effective; a SINGLE 'ugly fact' can show it is not so."

Many 'ugly facts' have been published

Levels of CLINICAL Evidence





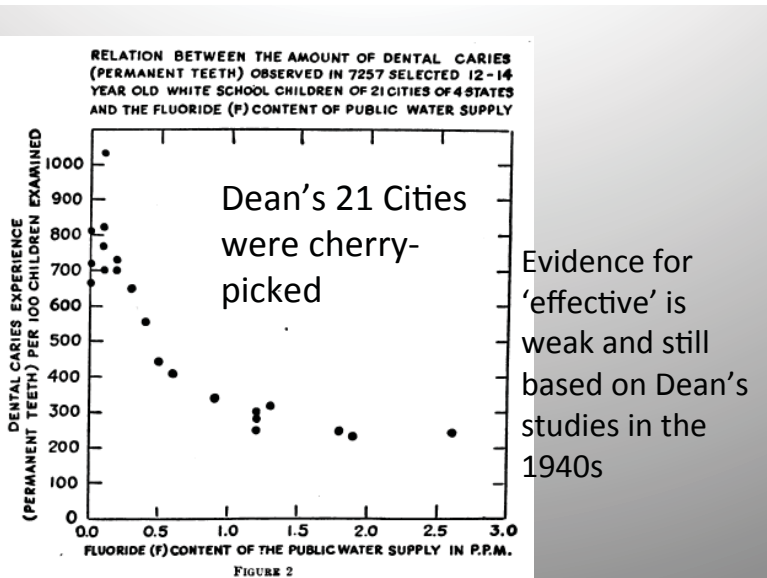
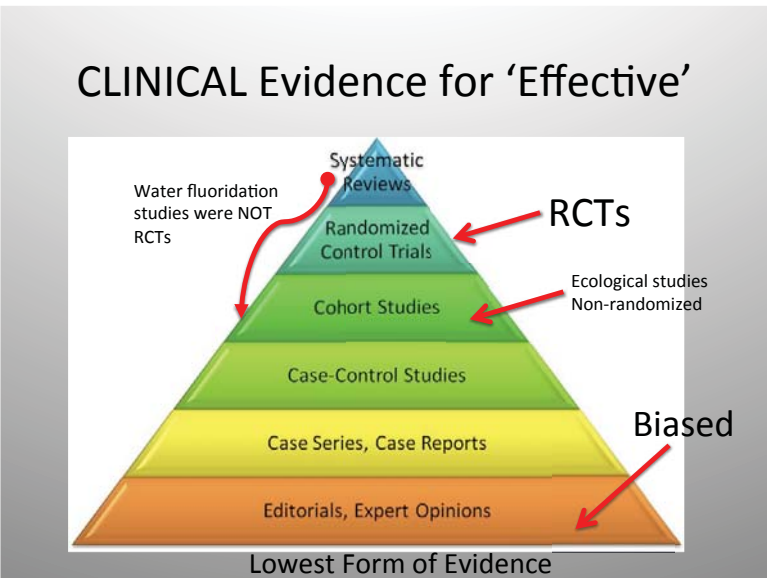
Cochrane Trusted evidence. Informed decisions. Better health.

Our evidence About us Get involved News

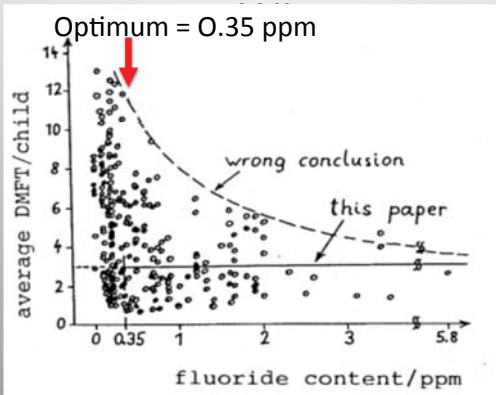
Water fluoridation to prevent tooth decay

[Iheozor-Ejiofor Z. et al. 2015](#)

- Biased: Funded by the CDC, conducted by oral health epidemiologists
- NOT ONE randomized, double blinded clinical study
- Used weaker studies (non-randomized before and after controlled studies)
- Only 3 studies after 1975 (when fluoridated toothpaste gained widespread use)
- Studies did not control for many confounders (especially delayed tooth eruption)
- Marginal benefit if any at all

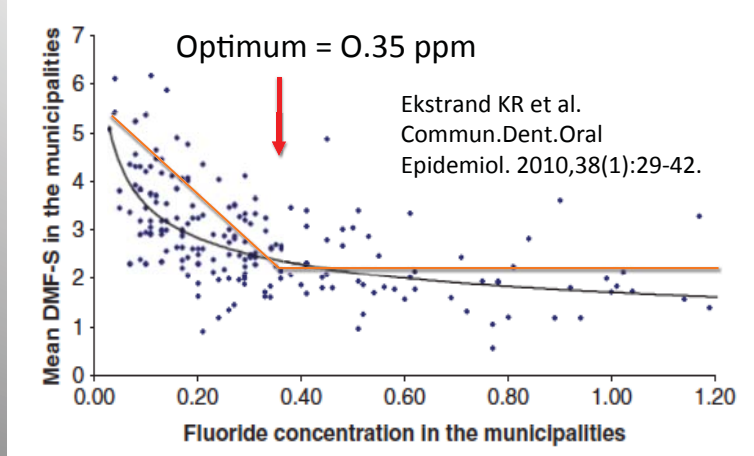


When ALL cities were examined, the optimum was closer to 0.35

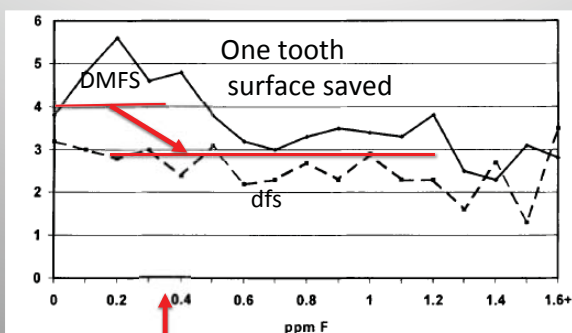


Ziegelbecker R, Ziegelbecker R C. WHO Data on Dental Caries and Natural Water Fluoride Levels. *Fluoride* 26 263-266 1993.

New research confirms a lower optimum



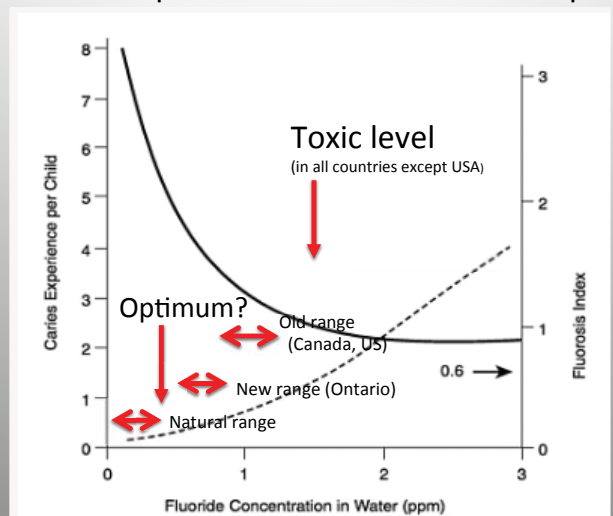
Health Canada looked at only 2 studies



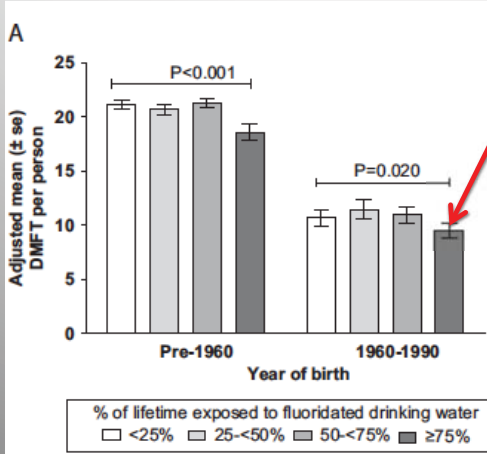
0.35 ppm

Heller, K.E., Eklund, S.A. and Burt, B.A. (1997) *J. Public Health Dent.*, 57: 136-143.

Therapeutic and toxic DOSES overlap



Fluoridation's benefit is NOT cost effective



A lifetime (40 years) of fluoridation saves maybe ONE dental filling/person

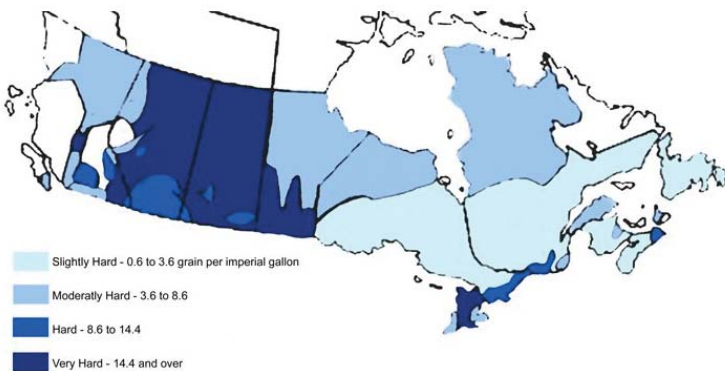
Slade G. et al. (2013) J Dent Res

The benefit of fluoride in drinking water cannot be demonstrated without taking into account other trace minerals

Associated with decreased caries	Associated with increased caries
Calcium Magnesium Molybdenum Vanadium Strontium	Copper Iron Manganese

Glass RL et al. *Arch Oral Biol.* 1973 Sep;18(9):1099-104.
Lippert & Hara. *Caries Res.* 2013;47(1):34-49.

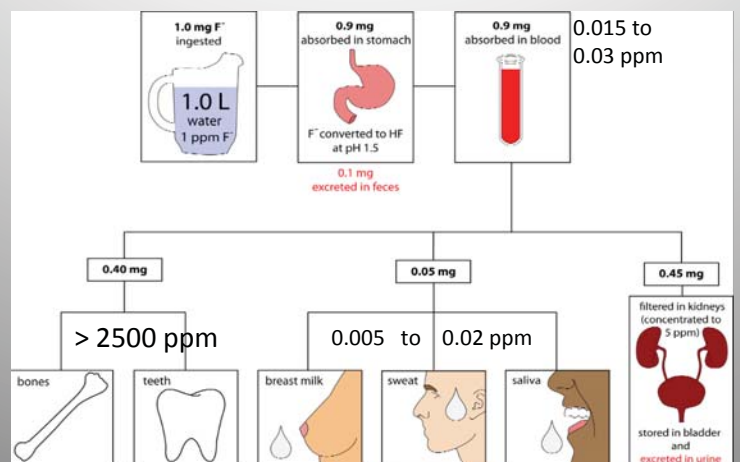
Water hardness could affect caries AND fluorosis depending on WHERE you live in Canada



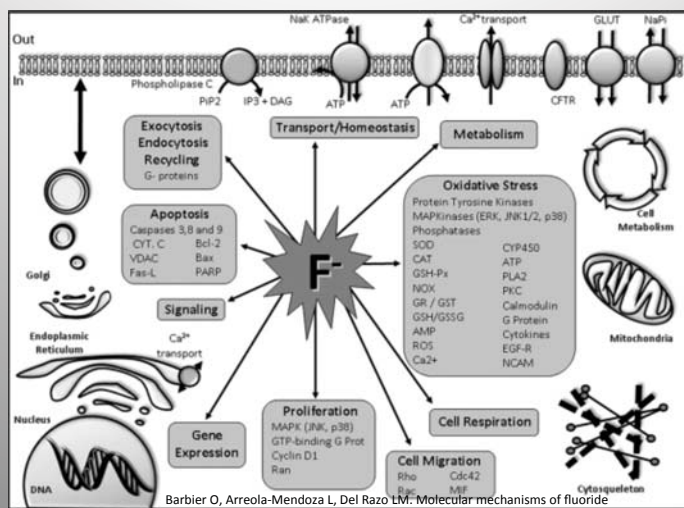
Siftocanada.com

<http://www.water-research.net/hardness.htm>

Human fluoride Metabolism



Fluoride effects on human cells



Dental fluorosis DOES get worse with time

Limeback H, Vieira AP, Lawrence H. Improving esthetically objectionable human enamel fluorosis with a simple microabrasion technique. *Eur J Oral Sci.* 2006 May;114 Suppl 1:123-6;



-teeth erupt chalky white

-then lose surface enamel and pick up stain

Appearance after microabrasion

Fluorosis in Canada

- Every 10th child has 'objectionable' fluorosis
- >40% have some signs of fluorosis

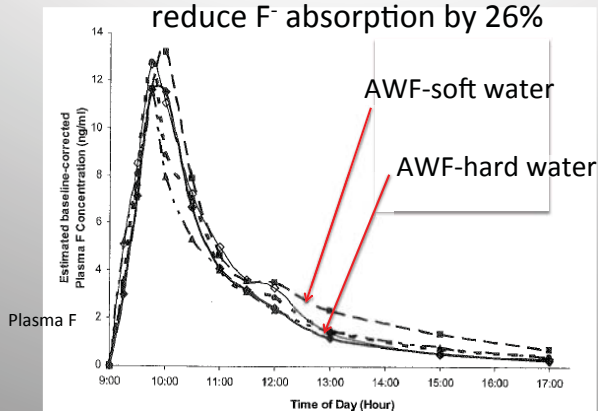


Clark DC et al. *Community Dent Oral Epidemiol.* 2006

Limeback H et al. *Eur J Oral Sci.* 2006

Ito, D. (2007) MSc Thesis

Calcium and magnesium (hard water) reduce F⁻ absorption by 26%



Maguire A. et al. Bioavailability of fluoride in drinking water: a human experimental study. *J Dent Res.* 2005 Nov;84(11):989-93.

Canadian Dental Association Recommendation to prevent dental fluorosis

the total daily fluoride intake from all sources should not exceed 0.05-0.07 mg/kg/d

400% higher (in order to minimize the risk of dental fluorosis) = 0.2 mg/kg/day

0.5 ppm

0.7 – 1.0 ppm



Clifford H, Olszowy H, Young M, Hegarty J, Cross M. Fluoride content of powdered infant formula meets Australian Food Safety Standards. Aust N Z J Public Health. 2009 Dec;33(6):573-6.

Infant formula calcium provides no protection against fluoride in tap water

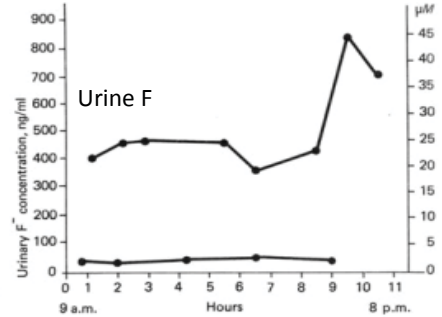


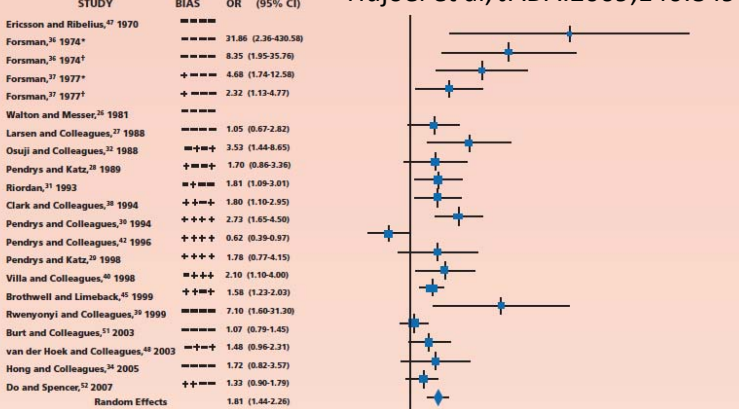
Fig. 2. Urine concentration of fluoride ng/ml (μM) in a bottle-fed infant (upper curve) and in a breast-fed infant (same subjects as in fig. 1).

At 1 ppm, bottle fed infants have 100X higher intake of fluoride than breast fed infants

Ekstrand J, Hardell LI, Spak CJ. Fluoride balance studies on infants in a 1-ppm-water-fluoride area. Caries Res. 1984;18(1):87-92.

Use of Infant Formula Versus Breast Milk or Cow's Milk

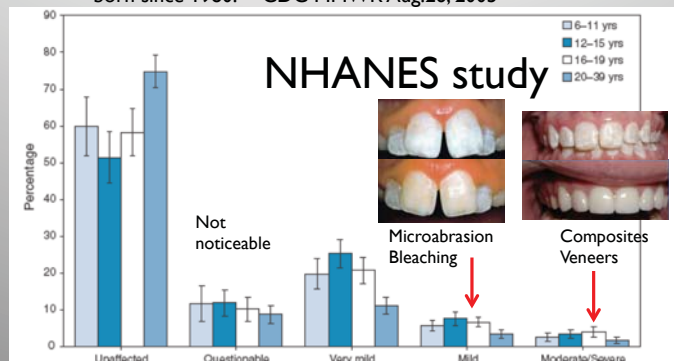
Hujoel et al, JADA:2009,140:849



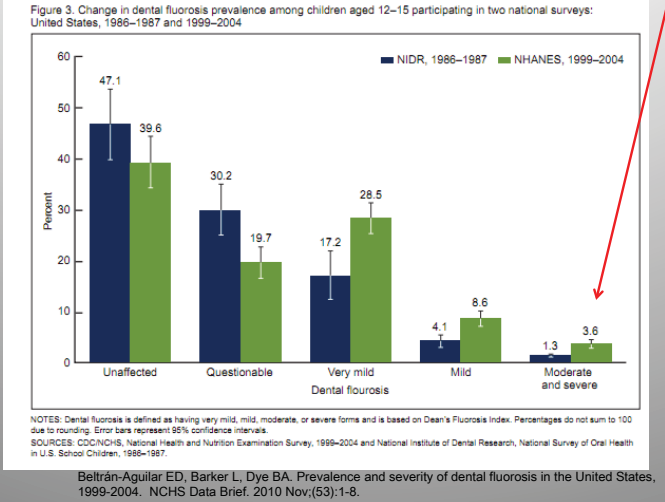
Infant formula made with fluoridated tap water INCREASES the RISK OF EXPERIENCING FLUOROSIS

Largest Study in the US- 10% have objectionable fluorosis

"Prevalence of enamel fluorosis has increased in cohorts born since 1980." CDC MMWR Aug.26, 2005



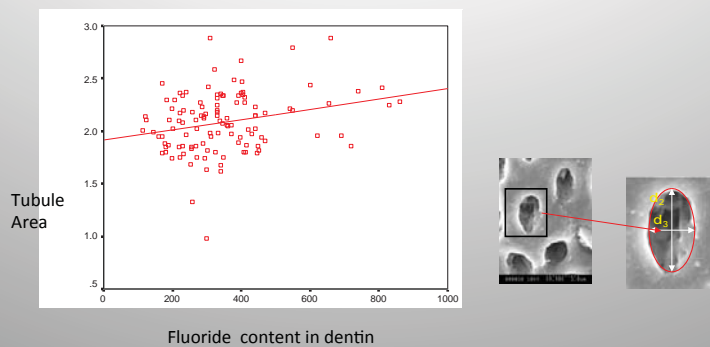
Moderate/Severe fluorosis has been increasing



“Minimal correction reduced the savings to \$3 per person per year (PPPY) for a best-case scenario, but this savings is eliminated by the estimated cost of treating dental fluorosis.”

Ko L, Thiessen K. A critique of recent economic evaluations of community water fluoridation. Internat J Occup Environ Health 2015 VOL. 21 NO. 2: 91–120.

Fluoride affects tooth dentin tubules



Viera AP, Hancock R, Dumitriu M, Limeback H, Grynpsas MD. Fluoride's effect on human dentin ultrasound velocity (elastic modulus) and tubule size. *Eur J Oral Sci.* 2006 Feb;114(1):83–8.

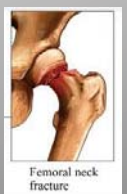
Effect of Fluoride on Tooth Dentin

EFFECT	RESULT
<microhardness	Increased tooth fractures
-larger tubules	more rapid caries
-crystal growth disturbance	Mechanical problems and more severe caries



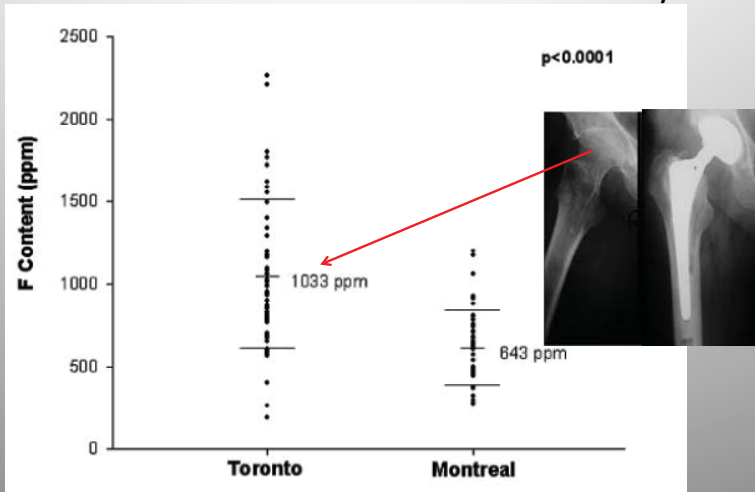
Dentmat.com

Dentin fractures are like bone fractures



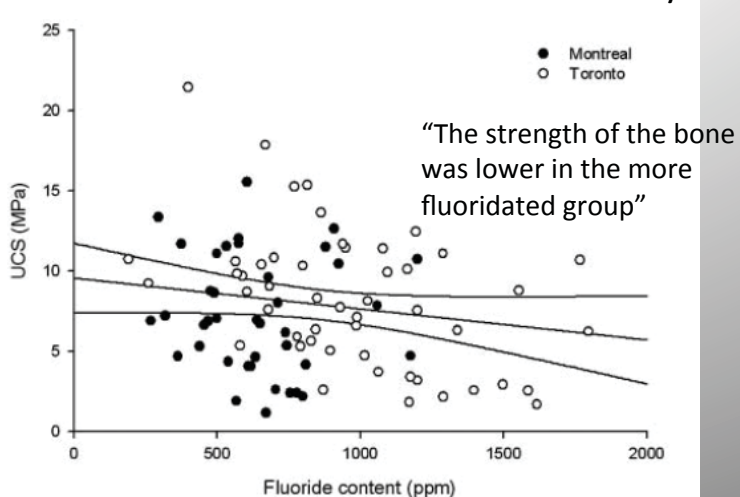
Femoral neck fracture

Toronto vs Montreal Bone Study



Chachra D. Limeback H. et al. J Dent Res. 2010

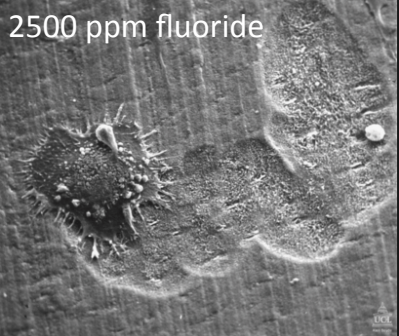
Toronto vs Montreal Bone Study



Chachra D. Limeback H. et al. J Dent Res. 2010

Effect of fluoride accumulation in bone on bone cells

Osteoclast resorbing bone



- early bone cell death
- release of high F- levels to immune cells
- change in bone architecture

NRC Report 2006

...may induce malignant tumours!

[AREA OF CONCERN]

IS FLUORIDE WEAKENING BONE?

Scientists have focused on fluoride's effects on bone because so much of the chemical is stored there. Studies have shown that high doses of fluoride can stimulate the proliferation of bone-building osteoblast cells, raising fears that the chemical may induce malignant tumours. Fluoride also appears to alter the crystalline structure of bone, possibly increasing the risk of fractures.

Labels in diagram: Periosteum, Marrow, Spongy bone, Compact bone, Osteoblasts forming new bone, Existing bone, Blood-vessels, Proliferation of osteoblasts, Layer of new weak bone, Fluoride ions.

▲ Normal Bone Formation ▲ Effects of Excessive Fluoride

Fagan, D. Second thoughts about fluoride. Sci. Amer Jan, 2008, 74-81.

Age-specific fluoride exposure in drinking water and osteosarcoma (United States)

Elise B. Bassin · David Wypij · Roger B. Davis · Murray A. Mittleman

546% increased risk to bone cancer !!!!

“Our exploratory analysis found an association between fluoride exposure in drinking water during childhood and the incidence of osteosarcoma among males but not consistently among females”

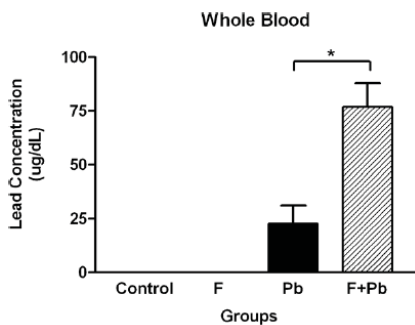


Confirmation of and explanations for elevated blood lead and other disorders in children exposed to water disinfection and fluoridation chemicals

Myron J. Coplan^{a,*}, Steven C. Patch^b, Roger D. Masters^c, Marcia S. Bachman^a

Using H_2SiF_6 as a fluoridation chemical increases blood lead levels more than NaF

ANY fluoride intake increases lead uptake



“...co-exposure to fluoride increases lead concentrations in the blood and in calcified tissues in animals exposed to lead from the beginning of gestation. These findings suggest that a biological effect not recognized so far may underlie the epidemiological association between increased BPb levels in children and water fluoridation.”

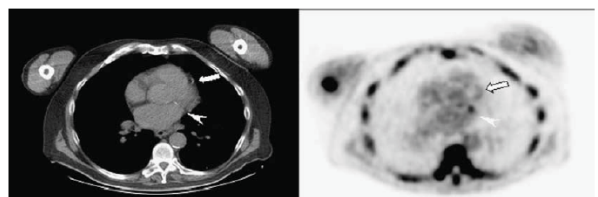
Sawan RM, Leite GA, Saraiva MC, Barbosa F Jr, Tanus-Santos JE, Gerlach RF. Fluoride increases lead concentrations in whole blood and in calcified tissues from lead-exposed rats. Toxicology. 2010 Apr 30;271(1-2):21-6.

Original article

Association of vascular fluoride uptake with vascular calcification and coronary artery disease

Yuxin Li^a, Gholam R. Berenji^a, Wisam F. Shaba^a, Bashir Tafti^a, Ella Yevdayev^a and Simin Dadparvar^b Nuclear Medicine Communications 2012, 33:14–20

Fluoride accumulates in coronary arteries where they are calcifying



Computed tomography (left) and positron emission tomography (right) images show coronary calcification and fluoride uptake in the left anterior descending coronary artery (arrow) and the circumflex coronary artery (arrow head).

Fluoride accumulates in human pineal glands and lowers melatonin

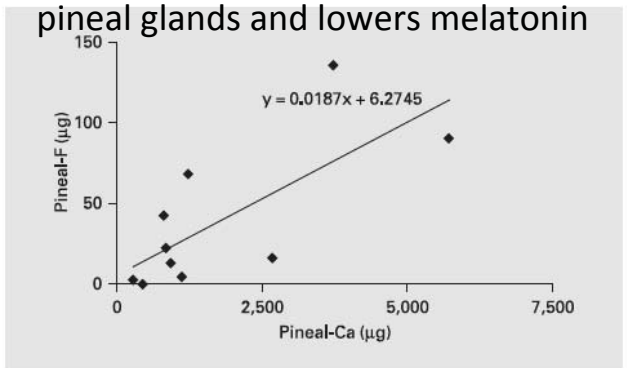


Fig. 1. The relationship between the calcium and fluoride contents of ten aged human pineal glands.

Luke J. Fluoride deposition in the aged human pineal gland. Caries Res. 2001;35(2):125-8.

Fluoride from water fluoridation accumulates over a lifetime in:

- **Bones** (making them more brittle and increasing lead uptake)
- **Teeth** (decreasing strength and increasing dentin caries)
- **Calcifying atherosclerotic plaque** (increasing the risk for heart attacks and stroke)
- **Pineal glands** (lowering melatonin)

Conclusions

- AWF toxicity is well supported by science
- Because of these 'ugly facts' as outlined, 'Safe and Effective' claim for artificial water fluoridation must be altered or completely abandoned

It's OUR HEALTH • It's OUR RIGHT • It's OUR CHOICE!

The **TOXIC TRUTH** about
ARTIFICIAL WATER FLUORIDATION

You're invited to attend this once in a lifetime important public presentation
with Honoured Guest Dr. A.K. Susheela from New Delhi, India

"The Harmful Effects of Fluoride on Human Health"

"The evidence I will provide on the harmful effects of fluoride on human health unequivocally proves the point that fluoride is disease causing and not disease preventing." Dr. A.K. Susheela



HONOURED GUEST SPEAKER

**World Renowned
Fluoride Toxicity & Fluorosis Expert**

Dr. A.K. Susheela Ph.D., F.S.Sc., F.A.M.S.

Professor (Dr) A.K. Susheela is a world renowned scientist from India with more than **35 years of research experience in the field of Fluoride and Fluorosis and its adverse effects on human health.** Professor of Anatomy (Histochemist), member of the Faculty of the All India Institute of Medical Sciences, Director of the Fluorosis Research and Rural Development Foundation in New Delhi, Fellow of the Indian Academy of Sciences and the National Academy of Medical Sciences and a Sr. Consultant to the Indian Government. Dr. Susheela has published more than 100 scientific papers in international peer-reviewed biomedical journals. She has access to more than 70 years of fluoride research statistics and is one of the **preeminent world experts on fluoride intoxication.**

EVENT DETAILS

Dr. A.K. Susheela Presentation

Wednesday, October 12th, 2016

7:30 - 9:30 p.m. including Q&A

Venue ~ Le Dome

1173 North Service Rd E, Oakville, ON L6H 1A7

Doors Open 6:00 p.m.

Optional Documentary Screening ~ OUR DAILY DOSE ~ 6:45 - 7:15 p.m.

Tickets at the door ~ \$20.00 ~ Free OW/ODSP recipients

RSVP Contact Liesa at (905) 467-2018

SPECIAL THANKS TO ALL OUR GENEROUS SPONSORS!

Litigation to End Fluoridation

Speaker Series Fundraising Campaign

This special event is kindly sponsored by the generosity of many caring individuals who are taking a stand in order to protect our health, our right and our choice. Thank you for making a difference in our world for a healthier and brighter future.

**Concerned Residents of Peel are calling for an
URGENT CALL TO ACTION
TO END ARTIFICIAL WATER FLUORIDATION!**

Liesa Cianchino, Chair Concerned Residents of Peel



YOUR VOICE WILL MAKE THE DIFFERENCE!

Please plan to join us on the right side of History



SCIENTIFIC FACTS AND DATA ON FLUORIDE AND ITS ADVERSE EFFECTS

ON
HUMAN HEALTH
AND

Compelling Reasons for Discontinuation of
Fluoridation of Community Water Supply.

Presented to :

- Water Fluoridation Committee (WFC). Region of Peel
- Councillors of Municipalities of various Towns
- Canadian Government Officials.

By

Prof. (Dr.) A.K. Susheela, Ashoka Fellow; Ph.D., F.A.Sc., F.A.M.S.

- Executive Director, Fluorosis Foundation of India
(Fluorosis Research & Rural Development Foundation)
- Former Professor , All India Institute of Medical Sciences,
New Delhi, INDIA.

October 2016

CONTENTS

1. DRINKING WATER QUALITY STANDARD FOR FLUORIDE :
GLOBAL SCENARIO
2. WHY DRINKING WATER WAS / IS BEING FLUORIDATED ?
3. HEALTH PROBLEMS EMANATING FROM FLUORIDE
CONSUMPTION
4. IRRITABLE BOWEL SYNDROME : REASONS
5. FOR DETECTING FLUORIDE TOXICITY (POISONING)/
FLUOROSIS : TESTS REQUIRED.
6. FLUORIDE TEST REPORT OF PATIENTS TO DIFFERENTIATE
SKELETAL FLUOROSIS VS. SKELETAL FLUOROSIS WITH
RENAL FAILURE
7. FLUOROSIS / FLUORIDE POISONING / FLUORIDE TOXICITY :
HOW TO IMPROVE HEALTH
8. TAKE AWAY MESSAGE

1

DRINKING WATER QUALITY STANDARD FOR FLUORIDE GLOBAL SCENARIO

1. SENEGAL (WEST AFRICA) - 0.6 ppm (mg / L) [LANCET 1988]
2. CHINA - 0.5 ppm
3. THAILAND - 0.5 ppm
4. INDIA - 1.0 ppm. MAXIMUM LIMIT WHICH BODY MAY
TOLERATE; LESS THE BETTER AS F⁻ IS INJURIOUS TO HEALTH (BIS 2012)
(HIGHEST F⁻ IN GEOLOGICAL CRUST) + FOOD & BEVERAGES AS
ADDITION OF BLACK ROCK SALT - F⁻ = 157 ppm. From 1987 - till date
INDIA DEFLUORIDATING WATER)
5. US EPA - 0.7 ppm MAXIMUM CONTAMINANT LEVEL
DWQ STANDARD OF US, 1962 ACT- AMENDED 52 years later in
April 2015
6. ALL EUROPEAN NATIONS STOPPED FLUORIDATION - 30 YEARS AGO
DUE TO HEALTH PROBLEMS
7. WHO GUIDELINE - 1.5 ppm F⁻ desirable. (NOT STANDARD)
8. PROBLEM NATIONS (As of 2016) :
 - AUSTRALIA - FLUORIDATES Drinking Water
 - BRITAIN - FLUORIDATES Drinking Water
 - CANADA - FLUORIDATES Drinking Water

2

WHY DRINKING WATER WAS / IS BEING FLUORIDATED ?

- Reasons :
- It was thought to be preventing Dental Caries.
 - How ? F⁻ kills the bacteria breeding in oral cavity
 - Dental Caries was popularized since 1940s as
F⁻ deficiency disorder. [In fact, in this Universe there is
no disease due to F⁻ deficiency]
 - Water was then fluoridated to correct the deficiency.
 - Medication without consent; side effects occurred. Population in
distress.
 - F⁻ being an electronegative element, it was thought
that it will bind with positively charged Calcium ⁺⁺ Ions
and make teeth stronger.
 - It is a myth and no science
 - Ample scientific evidence NOW available for prevention of
Caries through promotion of Oral Hygiene & Health.
 - Good nutritive diet with high calcium to have strong teeth.
 - In 1940s, there was hardly any Scientific Evidence on the
harmful effects of F⁻; research was in primitive stages.
 - Times have changed. F⁻ is a deadly chemical.

HEALTH PROBLEMS EMANATING FROM FLUORIDE CONSUMPTION

1. CLASSICAL
 - NON-SKELETAL FLUOROSIS (1970s)
 - DENTAL FLUOROSIS (1930s)
 - SKELETAL FLUOROSIS (1930s)
 2. FLUOROSIS LINKED DISEASES :-
 - ◆ Irritable Bowel Syndrome (Earliest signs)
 - Tendency to visit the Urinal / Toilet more frequently (Though not Diabetic) Polyuria / Polydipsia.
 - Severe muscle weakness : unable to walk even short distances.
 - Anaemia (Low Haemoglobin)
[Anaemia in pregnancy ; Anaemia in School Children, Anaemia in General Population – not responding to IRON + FOLIC ACID Supplementation]
 - Pre-term delivery, Low Birth Weight Babies, Still birth, Abortions, Intra-uterine deaths
 - ◆ Blood Vessel Blockage : High BP, High Cholesterol → Angiogram → Angioplasty; Multiple Vessels blocked → Bypass Surgery
 - ◆ Kidney Failure : Dialysis, Renal Transplant
 - ◆ Stroke
 - ◆ Cancer
- ◆ Earliest complaints;
◆ Later Stages

IRRITABLE BOWEL SYNDROME REASONS

- F⁻ is a **Neurotoxin** (Damages Nerve Cells / Nerves)
 F⁻ is a **Hormone Disruptor** (Hormone – Life line Disruptor)
 F⁻ is an **Enzyme Inhibitor** (Inactivation of Chemical Reactions)
- Results in Damages to the Gastro-intestinal system : Both Structural and Functional**
- The microvilli – the fine structural entity – " hair like " structures lining the surface – " fall off " leading to :
 1. Non- absorption of nutrients from Diet
 2. Non- absorption of orally administered Drugs
 3. No mucus production by "Goblet Cells"
 4. Cell surfaces are cracked and one **feels pain** in the Stomach
 5. No appetite for food; nausea
 6. Peristaltic movement of the Gastro-intestinal track disappears Leads to constipation.
- Upon withdrawal of F⁻ : GI Mucosa Regenerates **within a couple of days**
- Signs of Irritable Bowel Syndrome due to F⁻, disappears (Drugs not required)
 - **Haemoglobin** Improves. Individual feels **NORMAL** and **ACTIVE**

FOR DETECTING FLUORIDE TOXICITY (POISONING) / FLUOROSIS

TWO ESSENTIAL TESTS TO BE DONE.

TEST I : Fluoride levels to be tested in :

	Normal Range
• Blood (Serum)	0.02 – 0.05 ppm
• Urine	0.1 – 1.0 ppm
• Drinking Water	Less the better not to exceed 1.0 mg / L.

TEST II : An X-Ray Radiograph

Best Option : FOREARM – X-Ray

Membrane covering bones – A soft tissue would transform into Bone-like structure. Hard – visible in X-rays ie. **Ectopic Calcification.**

TEST I & II RESULTS POSITIVE. Confirmation of F⁻ poisoning / F⁻ Toxicity / FLUOROSIS.

Fluoride test Report of Patients to differentiate Skeletal Fluorosis vs. Skeletal Fluorosis with Renal Failure

Patient	Age	Sex	Serum F ⁻ (mg/L)	Urine F ⁻ (mg/L)	Drinking Water F ⁻ (mg/L)	Interosseous Membrane Calcification
Patient 1 Sk. Fluorosis	26	M	0.289 (x 5.7 times more)	13.90 (Kidneys functional)	9.770	✓
Patient 2 Sk. Fluorosis + Renal Failure	45	F	0.370 (x 7.4 times more)	0.960 Normal (Kidneys non-functional)	2.310	✓
Patient 3 Sk. Fluorosis + Renal Failure	40	M	0.290 (x 5.81 times more)	0.587 Normal (Kidneys non-functional)	Sample unavailabl e	✓

Normal reference range: Serum - 0.02 – 0.05 mg/L Urine 0.1 – 1.0 mg/L
 The Clinicians confirmed Kidney Function Tests not normal, for patients 2 & 3

FLUOROSIS / FLUORIDE POISONING / FLUORIDE TOXICITY**HOW TO IMPROVE HEALTH**

- No Drugs / Medicines
- Complete Recovery is achieved if the Disease suspected and confirmed at Early Stages, through 2 DIETARY INTERVENTIONS.

INTERVENTION I : DIET EDITING

(Withdraw F^- intake through all sources, including the use of Fluoridated toothpaste)

Urine F^- should be : 0.1 – 1.0 mg / L

INTERVENTION II : DIET COUNSELLING

(Promotion of Nutrients through diet)

- Essential Nutrients
- Vitamins
- Anti-oxidants
- Micronutrients & minerals & trace elements
(through consumption of vegetables, fruits, dairy products)

Through :

- Fruits / Fruit Juice fresh (No carton juice) for **Breakfast**
- Vegetables & Fruits mixed salad with home made dressing for **Lunch**
- Home made soup with vegetables for **Dinner**

TAKE AWAY MESSAGE**BENEFITS TO THE NATION :**

- ❖ *Economic benefit*
- ❖ *Hospital visits of the public reduce*
- ❖ *Drug purchase reduce*
- ❖ *Better health to prevail*
- ❖ *Infants & Children grow-up as intelligent citizens*
- ❖ *The general public enjoy life*
- ❖ *Earning capacity to improve*
- ❖ *The NATION TO PROSPER.*

- *The Scientific Information presented by Prof. (Dr.) A.K. Susheela, is from her personal research experiences in the Fluoride and Fluorosis front extending over a period of 4 decades (1974 – 2016).*

- *All the Scientific peer reviewed Publications, Books, Chapters published since 1974 until 2016 are available in the website of the Foundation : <http://www.fluorideandfluorosis.com>*

- *Prof. A.K. Susheela can be contacted from any part of the Globe on :*

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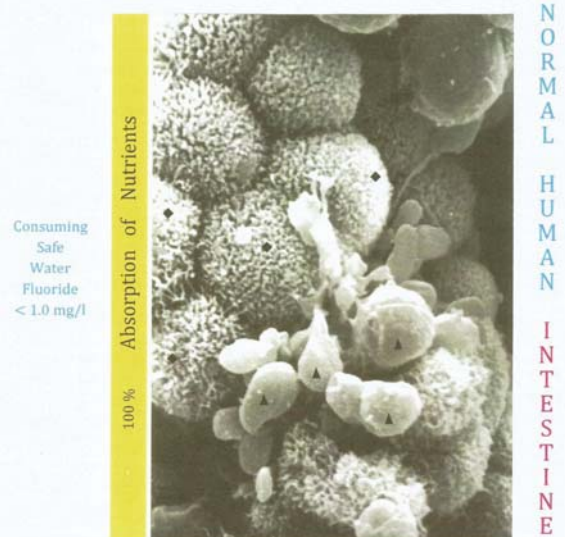


Fig 2: Scanning Electron micrograph of GI mucosa with normal columnar cells lining the Mucosa. The columnar cells are studded with microvilli besides mucus droplets produced in abundance by Goblet cells are seen. The microvilli / brush boarder is the structure responsible for absorption of nutrients. (◆microvilli studded columnar cell, ▲ mucus droplets)

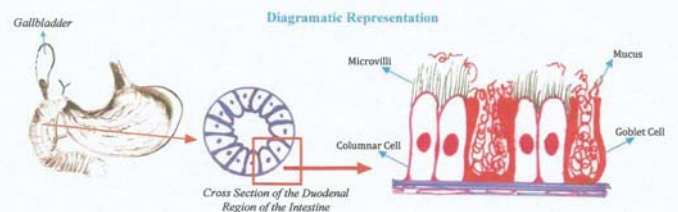
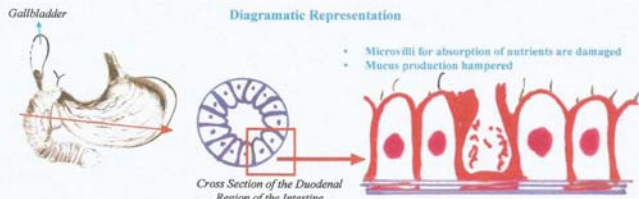




Fig.3: Note the Columnar Cell Surfaces, loss of microvilli is evident as cell surfaces are exposed with scanty microvilli or no microvilli. Mucus droplets are also reduced. The cell surfaces are bald with no microvilli at all (◆), some have scanty microvilli compared to Figure 2, No flowery appearance as microvilli are fallen off. Cell surfaces are fully exposed (○).



Gallbladder

Diagrammatic Representation

Cross Section of the Duodenal Region of the Intestine

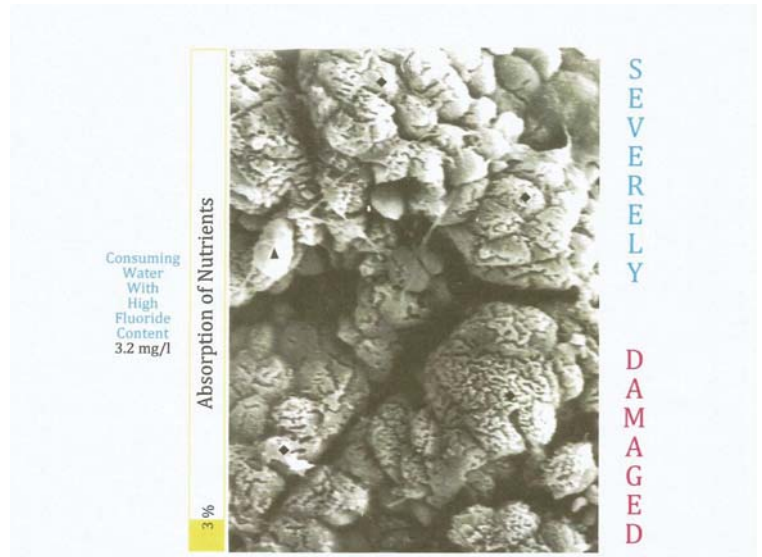
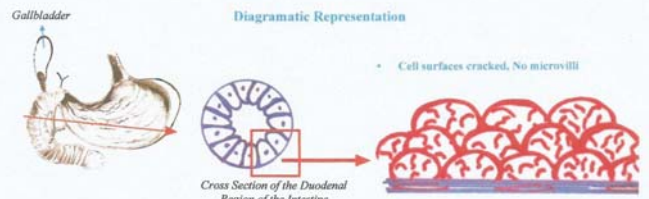


Fig.4: Note the columnar cell surfaces totally devoid of microvilli. The cell surfaces are cracked and no mucus droplets. Figures 3&4 are showing the devastating effects of fluoride on the GI mucosa which would prevent absorption of nutrients. However, upon withdrawal of fluoride from consumption, the mucosa would regenerate to normal within a few days, setting the Gut into normal mode of functioning enhancing absorption of nutrients.



Gallbladder

Diagrammatic Representation

Cross Section of the Duodenal Region of the Intestine

RECTIFICATION OF ANEMIA IN PREGNANCY
A.K. Susheela, N.K. Mondal, Kamala Ganesh and Rashmi Gupta, Fluorosis Foundation of India, Delhi-92
Email: FRnRDF@gmail.com | Website: www.fluorideandfluorosis.com

1 Background

ANEMIA : Highly Prevalent In Asia + African Nations

Anemia Prevalence in spite Of Iron (100 Mg) + Folic acid (500 µg) supplementation.

Millennium Development Goals MDG 5 & 4, could not be achieved by 2015.

MDG 5 - Reduction in Maternal Mortality Rate (MMR)

MDG 4 - Reduction in Infant Mortality Rate (IMR)

Major Factor responsible for the Issue ?
Environmental Toxin I.e. Consumption of Fluoride

2 OBJECTIVE

To correct ANEMIA in Pregnancy and improve birth weight of new born to achieve MDG 5 & 4.

FLUORIDE TOXICITY
F⁻ Toxicity responsible for:

Anemia In Pregnancy / High Maternal Mortality Rate (MMR)

Low Birth Weight Babies / Pre-term deliveries

Disabilities in infants and children

3 Fluoride is consumed / used through :

- Untreated ground water
- Food and beverages
- Consumption of Rock Salt in India; Magadi in African Nations, same volcanic origin with high F⁻ = 157 ppm.
- Consumption of Black / Red Tea with Lemon and / or without milk.
- Consumption of a home made chewing gum like substance "Churas", laced with Rock salt.
- Use of Dental products with fluoride (1000 - 4000 ppm).
- Industrial emission and inhalation of fluoride dust and fumes

4 Role of F⁻ in Systemic Circulation

F⁻ a highly toxic, corrosive chemical :
Major damages caused :

- Destroys microvilli; hampers mucus production; destroys muscle fibers.
- Due to loss of microvilli, non-absorption of nutrients and iron + Folic acid orally administered.
- Non-production of mucus, non-contractile muscle fibres in the wall of Intestine (lack of peristaltic movement) lead to Constipation

5 F⁻ Interferes with Thyroid hormone production ()

- Due to less of Thyroid hormones, lack stimuli on bone marrow, less number and abnormal RBCs produced.
- Abnormal RBCs (Echinocytes) are phagocytosed, eliminated from Blood stream Reduction in RBC leads to Low haemoglobin.
- F⁻ Destroys Gut bacteria + Vitamin B12 production reduced, essential for Hb production.
- Withdrawal of F⁻ consumption - reverses the 3 harmful effects of F⁻ listed above.

6 INTESTINAL MUCOSA

Normal + upon F⁻ consumption
Scanning Electron Micrographs Intestinal Mucosa - showing normal and damages inflicted

Figure 1

Scanning Electron Micrograph of 10 normal intestinal mucosa showing its living for 10 days. The surface with its mucus coat covered with microvilli. The surface is covered with mucus droplets. The surface is covered with mucus droplets. The surface is covered with mucus droplets.

7

Figure 2

Note the Columnar Cell Surfaces, loss of mucus droplets as cell surfaces are exposed with scanty microvilli or no microvilli. Mucus droplets are also reduced. The cell surfaces are bald with no microvilli at all (◆), some have scanty microvilli compared to Figure 1, No flowery appearance as microvilli are fallen off. Cell surfaces are fully exposed (○).

8

Figure 3

Note the Columnar Cell Surfaces, loss of mucus droplets as cell surfaces are exposed with scanty microvilli or no microvilli. Mucus droplets are also reduced. The cell surfaces are bald with no microvilli at all (◆), some have scanty microvilli compared to Figure 1, No flowery appearance as microvilli are fallen off. Cell surfaces are fully exposed (○).

9 Interventions Practised

- Diet Editing [For removal of F⁻]
- Diet Counselling [For enhancing nutrient intake]

Withdrawal of F⁻ consumption - corrects damages ; Regeneration of microvilli leads to absorption of nutrients + orally administered Iron + Folic acid

To ensure :

- By (1) Re-testing Urine F⁻ - reduced
- Hemoglobin content - enhanced

[UFL & Hb has Inverse relationship] MMR & IMR would stand corrected.

RECTIFICATION OF ANEMIA IN PREGNANCY
A.K. Susheela, N.K. Mondal, Kamala Ganesh and Rashmi Gupta, Fluorosis Foundation of India, Delhi-92
Email: FRnRDF@gmail.com | Website: www.fluorideandfluorosis.com

10 Results of our reach programme
Addressing Pregnant Women attending Antenatal Clinic in fluoride in the Daily India

Proposed to Follow in Antenatal Clinic,
(Anemia control and correction of low birth weight babies)

Test 1 : To Test Haemoglobin, show the result to the pregnant women. (Explain implications)
= Haemoglobinometer preferred (Fluoride)

Test 2 : To Test Urine Fluoride (Collect urine sample in plastic bottle, 30 ml only) - test on the laboratory using test Meter

Test 3 : To Test Drinking Water Fluoride. If Urine Fluoride is more than 1.5 mg/L, Drinking water collected in plastic bottle, 20ml) and test for Fluoride in the laboratory

Test 4 : Anemic pregnant women having, Hb < 10 gm/dl, High Urine Fluoride + 1.5 mg/L High Drinking water Fluoride + 1.5 mg/L

To Introduce (1) Diet Editing, to reduce consumption of Fluoride sources, including use of fluoridated salt, (2) Diet Counselling, to improve understanding on importance of consuming vegetables, fruits and dairy products. Through [Download] Leaflet [Download]

Test 5 : During visits to ANC, to check UFL & Hb until delivery. Maximum contact 120 days

ANC - will continue to provide test (100 mg) and Fluoride test (20ml) as per hospital guidelines

11 Results of Interventions Introduced

(1) Diet Editing
(2) Diet Counselling, Iron + Folic Acid Supplemented

Control : (1) No Diet Editing, Iron + Folic Acid supplemented

Table 1: The pregnant women in sample and control groups. Production in urine fluoride levels during initial visit to ANC and prior to delivery

Group	Mean ± SD	Median	Range	Max. (µg/L)	Min. (µg/L)
Sample (n=204)	0.075 ± 0.04	0.04	0.01 - 0.24	0.24	0.01
Control (n=207)	0.02 ± 0.01	0.01	0.01 - 0.08	0.08	0.01

Table 2: The impact of interventions on the Body Mass Index (BMI) of the Pregnant Women of sample and control groups

Group	Mean ± SD	Median	Range	Max. (kg/m ²)	Min. (kg/m ²)
Sample (n=204)	23.5 ± 3.5	23	18 - 35	35	18
Control (n=207)	22.5 ± 3.5	22	18 - 35	35	18

12

Table 3: The impact of interventions on the Body Mass Index (BMI) of the Pregnant Women of sample and control groups

Group	Mean ± SD	Median	Range	Max. (kg/m ²)	Min. (kg/m ²)
Sample (n=204)	23.5 ± 3.5	23	18 - 35	35	18
Control (n=207)	22.5 ± 3.5	22	18 - 35	35	18

13 Table 4: The Birth weight of the babies in the sample and control groups

Group	Low birth weight (kg) (n=12)	Percentage of low birth weight babies born (n=12)	Normal birth weight (kg) (n=192)	Percentage of normal birth weight babies born (n=192)
Sample (n=204)	0.88 ± 0.16	4.4%	1.92 ± 0.34	95.6%
Control (n=207)	1.02 ± 0.26	12.6%	2.05 ± 0.30	87.4%

* p value < 0.001 (significant)

* Note: Urine fluoride at ANC < 1.5 mg/L, 2 yrs were still within at 0.2 & 0.3 mg/L levels of fluoride. 2 and urine fluoride at ANC and ANC site of gestation.

14 Anemia In Pregnancy

Do's

- Check Hb, Vb B12, Urine F⁻ (<1.0 mg / L)
- Avoid to Dental problems, if any.
- Practice highest personal hygiene.
- Drink boiled and safe water (F<1.0 mg / L)
- Consume Non-toxic, Nutritive diet, freshly prepared.
- Consume fruits, vegetables and dairy products daily

Don'ts : (To avoid)

- Street food
- Unhygienic food
- Egg & Egg products
- Carbonated drinks
- Processed meat / chicken / cold cuts

15 Correction of Anemia + Improvement of Birth weight of Babies

Conclusion & Take Home Messages

- No short-cuts for improving iron during pregnancy and birth weight of babies.
- Provision of safe water for drinking & cooking with F⁻ as low as possible but not beyond 1.0 mg / L; lesser F⁻ the better. Urine F⁻ <1.0 mg / L.
- Provision of Nutritive diet, Non-toxic food with fruits, vegetables and dairy products.
- With Iron + Folic acid supplementation - a must.
- Highest personal hygiene practices to be introduced.
- Delivery in Hospitals to be encouraged
- Avoid to Dental problem, if any, tartar removed, cavities filled, attend to Gingivitis (inflammation of the gums).

16 MAJOR ACHIEVEMENTS

- Urine F⁻ Reduced to <1.0 mg / L = 1.0 - 0.254 mg/L = (65% pregnant women).
- Healthy Mother with Hb > 12.0 - 14.0 g/dL (77% pregnant women)
- Healthy Baby with Birth Weight > 2.5 - 3.89 Kg (82.5% babies born)

Achieved in India Only (2005 - 2010)

17 Improvement Upon Fluoride Withdrawal

18 Our Babies

Group	Mean Birth Weight (kg)	Median Birth Weight (kg)	Range Birth Weight (kg)
Sample (n=204)	3.5	3.2	2.5 - 4.5
Control (n=207)	3.2	2.8	2.0 - 4.0

TO EMPOWER POPULATION FOR NUTRITIONAL REQUIREMENTS THROUGH DIET FOR BETTER HEALTH
A.K. SUSHEELA, N.K. MONDAL, G. RASHMI,
FLUOROSIS FOUNDATION OF IND, DELHI, INDIA; E-mail: FRNRF@gmail.com

1. BACKGROUND INFORMATION

IN INDIA 60 – 80% SCHOOL CHILDREN : ANAEMIC

FROM 1. RURAL & URBAN
2. RICH & POOR
3. EDUCATED & UNEDUCATED

IRON & FOLIC ACID SUPPLEMENTED ACROSS THE COUNTRY BY GOVERNMENT
NO BENEFICIAL RESULTS

REASON : CONSUMPTION AND USE OF FLUORIDE
[FLUORIDE IS A NEUROTOXIN, HORMONE DISRUPTOR AND AN ENZYME INHIBITOR]

2. OBJECTIVES

- TO IMPROVE DIET WITH NUTRIENTS THROUGH**
 - SIMPLE
 - AFFORDABLE
 - EASY TO PRACTICE RECIPES
- TO EMPOWER MOTHERS AND TEACHERS HOW TO VIEW DIET**
- TO INTRODUCE AMPLE FRUITS + VEGIES, DAIRY PRODUCTS THROUGH**
 - JUICE FOR BREAKFAST
 - SALAD FOR LUNCH
 - SOUP FOR DINNER

3. School activities
Anaemic Children explained the link with Fluoride

Bottle being given to collect Urine for testing Fluoride

School Principal Participating ; Providing Blood for Hb testing

4. ESSENTIAL TESTS

1. DEWORMING ONCE A YEAR
2. TEST FOR URINE FLUORIDE
3. TEST FOR HAEMOGLOBIN (using digital portable machine)

4. TEST FOR DRINKING WATER FLUORIDE

- REVEAL RESULTS
- POINT OUT IMPLICATIONS
- SUGGEST REMEDIES

	Sch. 1	Sch. 2	Sch. 3	Sch. 4	Sch. 5	Sch. 6
	Sam.	Sam.	Sam.	Sam.	Com.	Com.
Baseline (Hb-12.0 g/dl)	None	None	None	None	None	None
Post 1 Month	20%	30%	35%	30%	9%	17%
Post 3 Month	31%	41%	50%	42%	14%	21.4%
Post 6 Month	41%	57%	52.6%	51.4%	27%	-

6. BETTER HEALTH THROUGH DIET

JUICES

SALADS

SOUPS

SNACKS

7. MAIN SPICES FOR COOKING –LUNCH/DINNER
Enrich Body with : micronutrients, Antioxidants & Vitamins through use of:

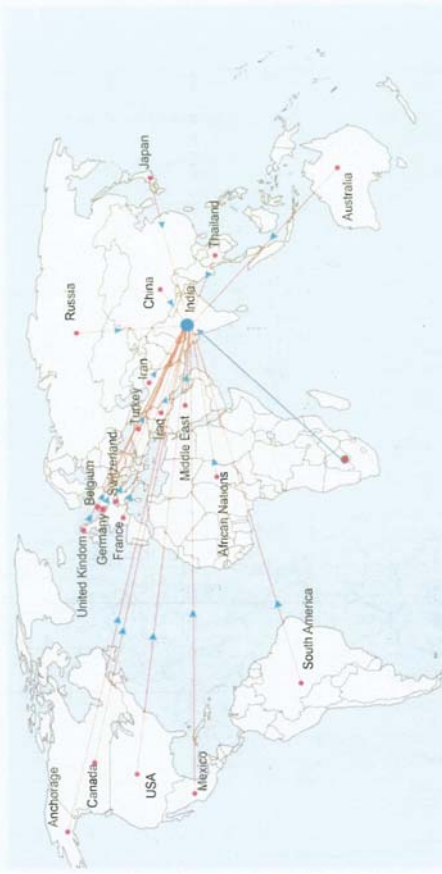
8. REMOVAL OF FLUORIDE & ADDITION OF NUTRIENTS

9. TAKEHOME MESSAGES :

- To address Anaemia, testing Hb & Urine Fluoride are necessary to identify the cause when non-responding to Iron & Folic acid supplementation
- Results to share with Parents & Teachers in the presence of their wards during Parent Teacher Meetings.
- Consume healthy snacks but no aerated drinks
- Use Fluoride-free toothpaste

The message conveyed through our Poster (PPS) during this Convention is to ELIMINATE FLUORIDE TOXIN THROUGH DIET EDITING AND PROMOTING NUTRIETS THROUGH DIET COUNSELLING TO EMPOWER POPULATION

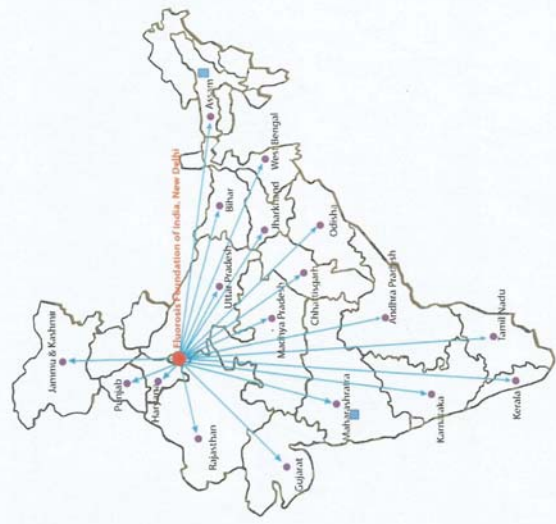
BMJ : INTERNATIONAL FORUM ON QUALITY AND SAFETY IN HEALTHCARE IN ASIA.
SINGAPORE 26 – 28 SEPTEMBER, 2016



GLOBAL CONSULTATION CENTRE

REACH-OUT OF THE FOUNDATION

Field Offices- Pune & Guwahati



91 Editorial Fluoride 48(2)91-92 April-June 2015 A step in the right direction Spittle D1

A STEP IN THE RIGHT DIRECTION

SUMMARY: The US Department of Health and Human Services Federal Panel on Community Water Fluoridation has made a final recommendation on community water fluoridation that replaces the relevant parts of the 1962 Drinking Water Standards. Whereas the earlier recommendation, based on the outdoor air temperature of geographic regions, involved a range of 0.7–1.2 mg F/L, the new recommendation, for community water systems that currently fluoridate or plan to do so, is for a level of 0.7 mg F/L. While this can be seen as a step in the right direction, the editorial writer considers that, based on the empirical evidence available, no fluoride should ever be added to a community water supply.

Keywords: Recommendation for fluoride in water; Water fluoridation.

In an update to the website of the Centers for Disease Control and Prevention, dated 24 April 2015,¹ it was noted that the US Department of Health and Human Services Federal Panel on Community Water Fluoridation has made a final recommendation on community water fluoridation that replaces the relevant parts of the 1962 Drinking Water Standards.² Whereas the earlier recommendation, based on the outdoor air temperature of geographic regions, involved a range of 0.7–1.2 mg F/L, the new recommendation, for community water systems that currently fluoridate or plan to do so, is for an optimal fluoride concentration in drinking water of 0.7 mg/L. The US Surgeon General, Dr VH Murthy, endorsed the recommendation and urged that communities adopt it.³

The Panel considered comments that a level of 0.7 mg F/L might cause adverse effects involving severe dental fluorosis, bone fractures, skeletal fluorosis, carcinogenicity, IQ and other neurological effects, and endocrine disruption. They stated that, after they thoroughly reviewed the evidence related to these concerns, they did not identify compelling new information requiring them to alter their assessment.²

In the discussion on IQ and other neurological agents, only eight references were quoted including the findings of a recent prospective study of a birth cohort in New Zealand which did not support an association between fluoride exposure and adverse effects on IQ.^{2,4} However, no comments were made on the limited power of the Broadbent et al. study because of the small size of the group with no exposure to fluoridated water, fluoride tablets or fluoridated toothpaste.^{5,6} The panel also noted that a meta-analysis of IQ studies involved drinking water concentrations of up to 11.5 mg/L, without noting that adverse IQ effects were found in a low-iodine group receiving just 0.88 mg F/L in their drinking water.⁷ No critique was made of more recent research linking, in 7.1-year-old children drinking water containing 1.12–4.07 mg F/L, the presence of moderate or severe dental fluorosis with cognitive impairment,⁸ or of an analysis, of the available empirical evidence, which found that, to protect the whole population against adverse IQ effects, the level of fluoride in drinking water should not exceed 0.1 mg/L.⁹

The Panel noted that while fewer than 1% of the population using fluoridated water in December 2010 received water with 0.7 mg/L, by the summer of 2011, just six months after the publication of the draft notice of the new level of 0.7 mg/

L, the percentage of the fluoridated-water-receiving-population receiving water with 0.7 mg/L had risen to 68%.²

Thus, while the recommendation of a drinking water fluoride level of 0.7 mg/L is better than the previous recommended range of 0.7–1.2 mg/L and a step in the right direction, it does not go far enough. Although the World Health Organization set, in 1984 and reaffirmed in 1993, a guideline of 1.5 mg F/L (1.5 ppm) as a “desirable” upper limit, it also allows countries to set Country Standards, their own national standards or local guidelines.¹⁰ The limit of 1.5 mg F/L has been seen to be unsuitable in some countries and lower Country Standards have been set of 1 mg/L in India and 0.6 mg/L in Senegal, West Africa.¹¹ A rider to the Indian limit is that the “lesser the fluoride the better, as fluoride is injurious to health.”¹¹

Hopefully, another 52 years will not have to pass before the 0.7 mg/L recommendation is replaced by a new recommendation that no fluoride should ever be added to a community water supply.

Bruce Spittle, Editor-in-Chief, *Fluoride*
Dunedin, New Zealand

REFERENCES

- 1 Centers for Disease Control and Prevention. Community water fluoridation. [updated 2015 Apr 24; cited 2015 May 14]. Available from: <http://www.cdc.gov/fluoridation/>
- 2 U.S. Department of Health and Human Services Federal Panel on Community Water Fluoridation. U.S. Public Health Service recommendation for fluoride concentration in drinking water for the prevention of dental caries. *Public Health Rep* 2015;130(4). [14 pages, E-pub ahead of print]. Available from: <http://www.publichealthreports.org/fluorideguidelines.cfm>
- 3 Murthy VH. Surgeon General's perspectives: community water fluoridation: one of CDC's "10 great public health achievements of the 20th century." *Public Health Rep* 2015;130(4). [3 pages, E-pub ahead of print]. Available from: <http://www.publichealthreports.org/fluorideguidelines.cfm>
- 4 Broadbent JM, Thomson WM, Ramakha S, Moffitt TE, Zeng JX, Foster Page LA, Poulton R. Community water fluoridation and intelligence: prospective study in New Zealand. *Am J Public Health* 2015;105(1):72-6. [abstract in *Fluoride* 2014;47(2):181].
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Consuming
Safe
Water
Fluoride
< 1.0 mg/l

Absorption of Nutrients
100 %



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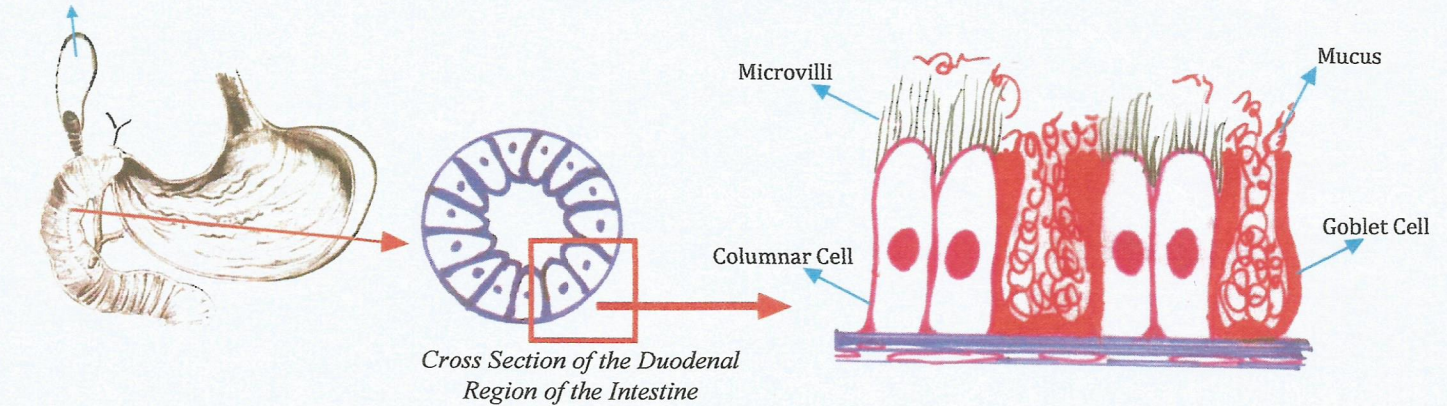
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Fig 2: Scanning Electron micrograph of GI mucosa with normal columnar cells lining the Mucosa. The columnar cells are studded with microvilli besides mucus droplets produced in abundance by Goblet cells are seen. The microvilli / brush boarder is the structure responsible for absorption of nutrients. (◆microvilli studded columnar cell, ▲ mucus droplets)

Gallbladder

Diagrammatic Representation



Consuming Water With marginally Elevated Fluoride 1.2 mg/l

Absorption of Nutrients

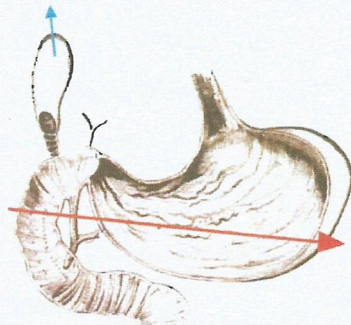
20 %



DAMAGED INTESTINE

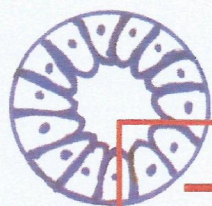
Fig.3: Note the Columnar Cell Surfaces, loss of microvilli is evident as cell surfaces are exposed with scanty microvilli or no microvilli. Mucus droplets are also reduced. The cell surfaces are bald with no microvilli at all (◆), some have scanty microvilli compared to Figure 1. No flowery appearance as microvilli are fallen off. Cell surfaces are fully exposed (○).

Gallbladder

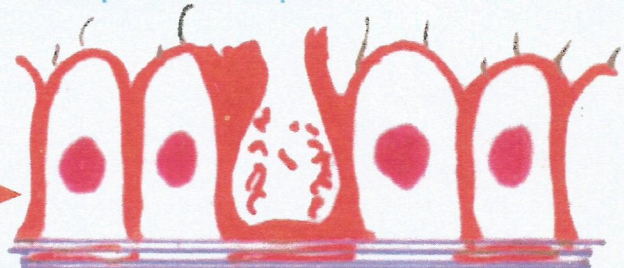


Diagrammatic Representation

- Microvilli for absorption of nutrients are damaged
- Mucus production hampered



Cross Section of the Duodenal Region of the Intestine



Consuming Water With High Fluoride Content 3.2 mg/l

Absorption of Nutrients

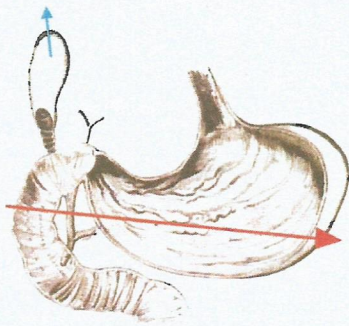
3%



SEVERELY DAMAGED

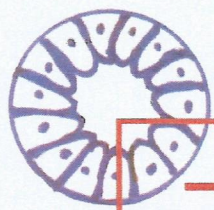
Fig.4: Note the columnar cell surfaces totally devoid of microvilli. The cell surfaces are cracked and no mucus droplets. Figures 2&3, are showing the devastating effects of fluoride on the GI mucosa which would prevent absorption of nutrients. However, upon withdrawal of fluoride from consumption, the mucosa would regenerate to normal within a few days, setting the Gut into normal mode of functioning enhancing absorption of nutrients.

Gallbladder

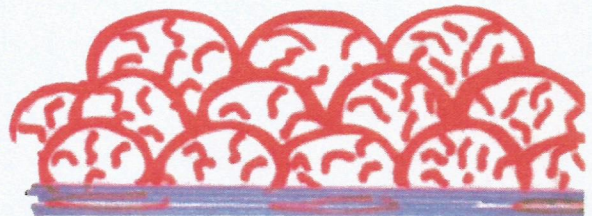


Diagrammatic Representation

• Cell surfaces cracked, No microvilli

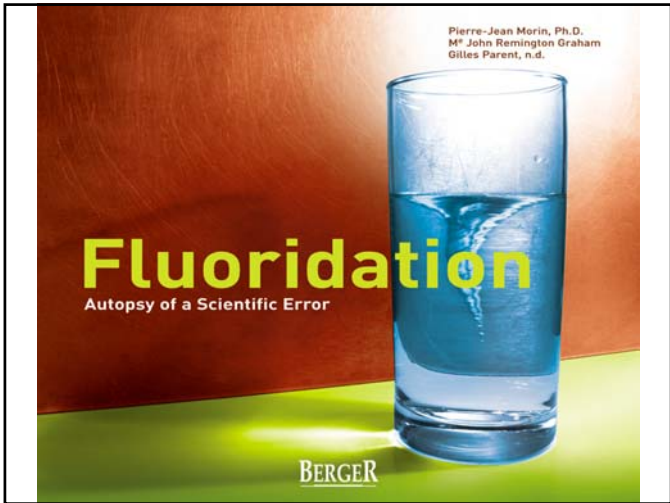


Cross Section of the Duodenal Region of the Intestine



**FLUORIDATION CHEMICALS ARE
UNREGULATED
UNTESTED
UNAPPROVED
INEFFECTIVE
DRUGS**

By
Gilles Parent, ND.A.
Co-Author of «Fluoridation: Autopsy of a Scientific Error»
APRIL 19th, 2018



2012 PEEL RESOLUTION

February 12, 2012 Passed a Resolution calling Health Canada to do at least:

1. 1 long-term toxicology study to determine the health effects in humans
2. at least 1 properly conducted controlled clinical trial to determine effectiveness

Objective:

to reassure the citizens of Peel that the use of fluorosilicates added to drinking water for the purpose of treating a disease is safe.

2017 PEEL RESOLUTION

February 22, 2017 Passed a Resolution calling Ministry of Health and Long Term Care to do at least:

1. To undertake appropriate and comprehensive toxicity testing necessary to reassure the public that the use of HFSA in water fluoridation treatments is safe;
2. Take legislative responsibility for the regulation and administration of HFSA in water fluoridation treatments across the province relieving local governments from what is a provincial responsibility.

**MINISTRY OF HEALTH'S RESPONSE
LETTER TO PEEL REGION**

«March, 23, 2018

Public health Ontario has review NSF/ANSI 60 on behalf of the ministry. NSF/ANSI 60 establishes requirements to be protective of human health for products and their impurities that may be added directly during water treatment, storage and distribution.»

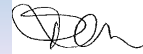
...

**MINISTRY OF HEALTH'S RESPONSE
LETTER TO PEEL REGION**

«The established safeguard noted above continue to ensure the safety of fluoride drinking water in Ontario. The ministry will also continue to monitor and review new research.

The ministry urges all municipalities to protect their communities from avoidable health issues by maintaining fluoride in their drinking water, to promote the health of all residents.»

Sincerely,



Roselle Martino
Assistant Deputy Minister
Population and Public Health Division

**MINISTRY OF HEALTH'S RESPONSE
LETTER TO PEEL REGION**

Ms Roselle Martino, assistant Deputy Minister is misleading the Committee :

1. The Ministry hasn't supplied the toxicological review as requested by Peel Region **to prove safety of HFSA**, so without it, **it cannot be claimed SAFE**;
2. The Ministry implies that NSF/ANSI 60 establishes requirements to be protective of human health for fluoridation chemicals **WHICH THEY DO NOT** (see NSF disclaimers);
3. The Ministry implies that NSF/ANSI 60 has the jurisdiction and the competence to guarantee the efficiency of HFSA **WHICH IT DOES NOT**;
4. The Ministry implies that it is legal and ethical to administer to a population a water treatment chemical to mitigate and prevent a disease **WHICH IT IS NOT**.

**MINISTRY OF HEALTH'S RESPONSE
LETTER TO PEEL REGION**

5. The Ministry assumes that fluoridation would supply to each citizen an exact and proper amount of fluoride when using tap water as a vehicle for the administration of the fluoride without considering the huge variability of daily intake of water and fluoride from all other sources. It make fluoridation of water an absurd vehicle of distribution of a drug as a daily dose cannot be controlled.
6. The Ministry assumes erroneously that concentration is equivalent to dose while such a concept is obviously invalid.
7. The Ministry assumes that it knows the exact daily dose of fluoride needed to prevent dental decay without causing any harm to anyone, including the most vulnerable subjects in the society; babies, children, the infirm, the elderly and those that drink a lot of water.
8. The Ministry assumes that it knows what no health authority in the world knows, the exact effective and safe dose of fluoride; that is either 1, 2, 3, 4, 5, 6 or 7 mg daily. **There aren't any scientific consensus on the exact effective and safe dose.**

MINISTRY OF HEALTH'S RESPONSE LETTER TO PEEL REGION

9. The Ministry assumes that it knows what **no health authority** in the world knows, the **exact effective and safe dose** of fluoride that would take in account the weight of the subject expressed in mg/kg/day; is it 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09 mg/kg/day.
10. Without knowing what the exact appropriate intake of fluoride that would be safe for the most vulnerable and that would be effective to prevent decay if such a dose would be proven safe and effective, the Ministry is putting the entire population at risk of side effects, including dental fluorosis that is already reported at an epidemic levels.

NSF/ANSI 60

TRADE REGULATORY ORGANIZATIONS

- **NO LEGAL JURISDICTION ON PRODUCTS USED FOR TREATING OR PREVENTING A DISEASE.**
- **NO COMPETENCY IN EVALUATING THE EFFECTIVENESS OF A SUBSTANCE USED FOR A THERAPEUTIC PURPOSE.**
- **NO COMPETENCY IN EVALUATING THE SAFETY OF A SUBSTANCE USED FOR A THERAPEUTIC PURPOSE.**

NSF DOCUMENTS

NSF International Standard/
American National Standard
for Drinking Water Additives —

**Drinking water treatment chemicals —
Health effects**

NSF DOCUMENT DISCLAIMERS

Disclaimers¹

NSF Standards provide basic criteria to promote and protect public health. Provisions for safety have not been included in this Standard because governmental agencies or other national standards-setting organizations provide safety requirements.

**NO CANADIAN OR AMERICAN GOVERNMENTAL AGENCY
HAS EVER PROVIDED SAFETY TOXICOLOGY STUDIES**

FOOD AND DRUG ACT DEFINITIONS

“drug”

“drug” includes any substance or mixture of substances manufactured, sold or represented for use in

- (a) the diagnosis, treatment, **mitigation or prevention of a disease, disorder or abnormal physical state**, or its symptoms, in human beings or animals,
- (b) restoring, **correcting or modifying organic functions** in human beings or animals

FOOD AND DRUG ACT DEFINITIONS

FOOD

Prohibited sales of food

4. (1) No person shall sell an article of food that

- (a) **has in or on it any poisonous or harmful substance;**
- (b) **is unfit for human consumption;**
- (c) consists in whole or in part of any filthy, putrid, disgusting, rotten, decomposed or diseased animal or vegetable substance;
- (d) is adulterated; or
- (e) **was manufactured, prepared, preserved, packaged or stored under unsanitary conditions.**

FOOD AND DRUG ACT DEFINITIONS

“food”

“food” includes any article manufactured, sold or represented for use as food or drink for human beings, chewing gum, and any ingredient that may be mixed with food for any purpose whatever;

(WATER IS A FOOD BY DEFINITION)

FOOD AND DRUG ACT DEFINITIONS

“Unsanitary conditions”

“unsanitary conditions” means such conditions or circumstances as might contaminate with dirt or filth, or render injurious to health, a food, drug or cosmetic.

FOOD AND DRUG ACT DEFINITIONS

Unsanitary manufacture, etc., of food

7. No person shall manufacture, prepare, preserve, package or store for sale any food under unsanitary conditions.

FOOD AND DRUG ACT DEFINITIONS

Deception, etc., regarding food

5. (1) No person shall label, package, treat, process, sell or advertise any food in a manner that **is false, misleading or deceptive** or is likely to create an erroneous impression regarding its character, value, quantity, composition, merit or safety.

LEGAL CLASSIFICATION OF FLUORIDATION CHEMICALS

1. TOXIC AND DANGEROUS SUBSTANCES?
2. DRUGS?
3. NATURAL HEALTH PRODUCTS?
4. MINERAL NUTRIENTS FOR FOOD FORTIFICATION?
5. FOOD ADDITIVES?
6. WATER TREATMENT CHEMICALS?

CLAIMED PURPOSE
DEFINES
THE LEGAL NATURE OF A
PRODUCT
AND ITS
APPLICATIONS OF LAWS
PERTINENT TO IT

WHY FLUORIDATION ?

1. Claimed to prevent dental cavities?

OR

2. To make drinking water safe/potable?

Products making
SPECIFIC HEALTH CLAIMS
e.g. Preventing Cavities

ARE DEFINED AS EITHER :

1. **DRUGS**

OR

2. **NATURAL HEALTH PRODUCTS**

THEY MUST THEN COMPLY WITH
STRICT REGULATIONS

Supreme Court of Canada 1957¹

Fluoridation

- is a "**compulsory preventive medication**",
- is "not to promote the ordinary use of water as a physical requisite for the body"
- has a "special health purpose".

**Ruling never contested by the
Canadian Government.**

1- Metropolitan Toronto v. Forest Hill (Village), [1957] S.C.R. 569
<http://csc.lexum.umontreal.ca/en/1957/1957scr0-569/1957scr0-569.html>

ARE THEY CONTROLLED AND
APPROVED BY HEALTH CANADA AS
**DRUGS OR
NATURAL HEALTH PRODUCTS?**

NO...

Petition #299, Answer #1 by Health Canada to the the Auditor General of Canada,
available from: http://www.ec.gc.ca/bvs.gc.ca/internet/English/pet_1a_e_333.html

**ARE THESE FLUORIDATION
CHEMICALS APPROVED BY
HEALTH CANADA AS
MINERAL NUTRIENTS FOR FOOD
FORTIFICATION?**

NO...

Petition #299, Answer #1 by Health Canada to the the Auditor General of Canada,
available from: http://www.ccaq-bvq.gc.ca/Internet/English/pet_ip_e_938.html

**IF DRUGS, NATURAL HEALTH PRODUCTS OR
SOURCES OF A NUTRIENT FOR FOOD
FORTIFICATION, THEY MUST BE PREPARED
AND STORED IN **HYGIENIC CONDITIONS**
AND HAVE **TOXICOLOGICAL TESTS****



**FLUORIDATION CHEMICALS ARE NOT
PREPARED WITHIN «GOOD
MANUFACTURING PRACTICES» («GMP»)**

Any drug, natural health product, nutrient for
food fortification or food should be prepared in
sanitary conditions required to satisfy the Food
and Drug Act related to the «**Good
Manufacturing Practices**» («GMP»)

**DOES HEALTH CANADA EXERT
ANY **REGULATION** ON
FLUORIDATION CHEMICALS?**

NO...

Petition #299, Answer #1 by Health Canada to the the Auditor General of Canada,
available from: http://www.ccaq-bvq.gc.ca/Internet/English/pet_ip_e_938.html



THEN,
WHAT
ARE
FLUORIDATION
CHEMICALS?

Fluoridation chemicals are unprocessed scrubber liquor of the phosphate industry smoke stack emissions or manufactured from fluoroapatite

If these emissions are released in the atmosphere, they are air pollutants

If these emissions are released in the river, they are water pollutants

When these same chemicals are added to the municipal water and somehow, they become a beneficial nutrient good for your teeth and your overall health...

Fluoridation chemicals are usually recycled toxic waste

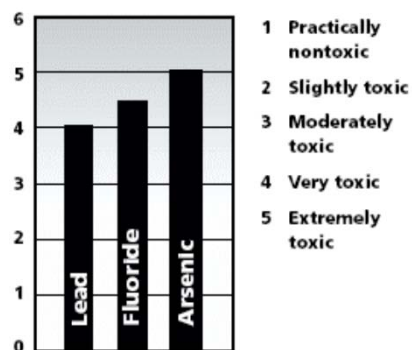


It comes with a small quantity of arsenic, lead, chromium, mercury, and nucleotides.

Fluoride Toxicity

SOURCE: base on lethal (LD 50) de Robert E.Gosselin and al, 1984. Clinical Toxicology of Commercial Products 5th ed., Williams and Wilkins, Baltimore.

Relative Toxicity



Untested, uncontrolled, unregulated chemical waste taken directly from the industry and dripped into your drinking water



Not of pharmaceutical grade nor food grade but industrial grade fluoride.

Are Fluoridation Products “Natural”?

NO...

They are MAN-MADE

ARE THEY WATER TREATMENT CHEMICALS?

HEALTH CANADA,
THE MINISTRY OF HEALTH AND
PUBLIC HEALTH AUTHORITIES
CLAIM THEY ARE.

ARE THEY REALLY WATER TREATMENT CHEMICALS?

NO...

Their aim is not to treat the water
to make it safe and drinkable.

Their aim is to prevent dental cavities.

**ARE FLUORIDATION CHEMICALS
COMPLIANT WITH STANDARD 60 OF
THE NATIONAL SANITATION
FOUNDATION (NSF)?**

NO...

They have a NSF certificate but do not
meet all the requirements of
NSF Standard 60.

The main essential
requirement
for the NSF Standard 60 is
chronic toxicological tests
that demonstrate
safety of the HFSA.

«Chronic» means «long term»

Are there any Chronic Toxicology Tests available for HFSA?

NO...

NSF Fact Sheet states that toxicological testing is required, but the NIEHS 2001 Review, US EPA and Safety Data Sheets state they DO NOT EXIST.

Sodium Fluorosilicate Material Safety Data Sheet

11. Toxicological Information

11.1 Acute toxicity:

Inhalation: No data available.

Oral: LD50, rat, 125mg/kg (Sodium hexafluorosilicate)

Dermal: No data available.

Irritation: No data available.

Sensitization: No data available.

Comments: No data available.

11.2 Chronic toxicity: No data available.

11.3 Carcinogenic Designation: None

<http://www.fluoridealert.org/pesticides/msds/sodium.fluorosilicate.solvay.pdf>

- Letters from the US Congressional Hearings
 - US EPA
 - National Institute of Environmental Health Sciences 2001 Review
 - HEALTH CANADA
 - ONTARIO MINISTRY OF HEALTH
 - NSF
- state that fluoridation products do NOT have TOXICOLOGICAL STUDIES
Therefore...

They have not been proven safe...

**IF FLUORIDATION CHEMICALS
DO NOT HAVE LONG TERM
TOXICOLOGICAL STUDIES, THEN
SAFETY
CANNOT
BE DEMONSTRATED**

They are not proven... safe...

Therefore...

They do not satisfy NSF Standard 60...

Therefore...

THE CERTIFICATION COULD BE CONSIDERED AS INVALID?

They are not compliant with Quebec and Ontario law (Ontario Safe Drinking Water Act)

Finally, what are fluoridation chemicals?

- 1. IF NOT DRUGS?**
- 2. IF NOT NATURAL HEALTH PRODUCTS?**
- 3. IF NOT MINERAL NUTRIENTS FOR FOOD FORTIFICATION?**
- 4. IF NOT FOOD ADDITIVES?**
- 5. IF NOT WATER TREATMENT CHEMICALS?**
- 6. THEY MUST BE HAZARDOUS WASTES?**

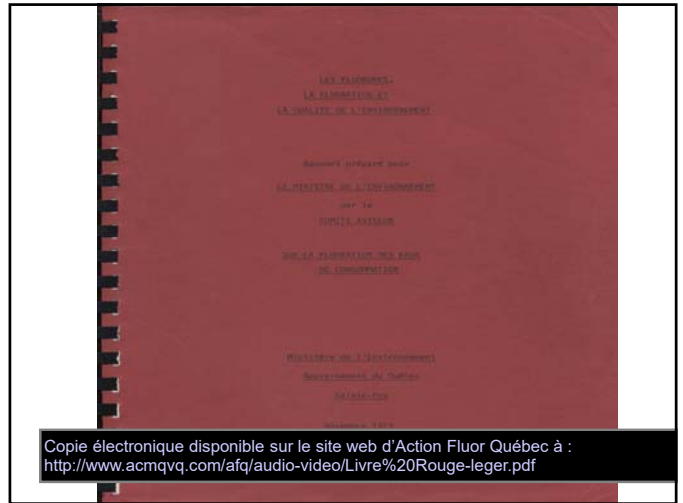
FLUORIDATION CHEMICALS SATISFY ALL CRITERIA FOR HAZARDOUS AND TOXIC WASTES

- Règlement sur les matières dangereuses c. Q-2, r.32, Loi sur la qualité de l'environnement (L.R.Q., c. Q-2, a. 31, 46, 70.19, 109.1 et 124.1)
- Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations DORS/2005-149 (FEDERAL)

THE LEGAL CLASSIFICATION OF FLUORIDATION CHEMICALS AS HAZARDOUS AND TOXIC SUBSTANCES ARE DETERMINED IN LAWS

13 laws et regulations

- Loi sur les produits dangereux L.R.C. (1985), ch. H-3
- Liste des substances toxiques – Annexe 1
- Liste des substances d'intérêts prioritaire LSIP1.
- Loi canadienne sur la protection de l'environnement -LCPE (1999) CH. 33
- Loi de 1992 sur le transport des marchandises dangereuses (1992, ch. 34)
- Règlement sur le transport des marchandises dangereuses
- Règlement sur l'exportation et l'importation de déchets dangereux et de matières recyclables dangereuses (REIDDMRD)
- Règlement sur les mouvements interprovinciaux des déchets dangereux
- Loi interdisant la vente, l'importation et la publicité de produits dangereux
- Règlement sur les produits chimiques et contenants de consommation (2001)
- Règlement sur les matières dangereuses c. Q-2, r.32
- Loi sur le contrôle des renseignements relatifs aux matières dangereuses
- Convention de Bâle sur le contrôle des mouvements transfrontiers de déchets dangereux et de leur élimination



TOXIC SUBSTANCES CAN FIT ONLY TWO CATEGORIES

1. TOXIC WASTES OR SUBSTANCES
2. DRUGS

HEALTH CANADA HAS NOT APPROVED ANY FLUORIDATION CHEMICALS AS DRUGS.

IT IS ILLEGAL TO ADMINISTER AN APPROVED OR UNAPPROVED DRUG WITHOUT A MEDICAL LICENCE, AND WITHOUT INFORMED CONSENT TO ANY RESIDENT.

**ADMINISTERING ANY DRUG,
APPROVED OR UNAPPROVED,
TO RESIDENTS
WITHOUT CONSENT
CONTRAVENES
ARTICLE 7 OF THE
CANADIAN CHARTER OF
RIGHTS AND FREEDOMS**

**Drugs Should Not Be Put Into
Drinking Water Because:**

1. No one can control how much of any drug is consumed daily by each individual.
2. Citizens are deprived of Informed Choice:
 - Information regarding risks and benefits
 - Choice to refuse or accept drug
 - No trained professional to assess medical need and adverse effects

**MUNICIPALITIES
SHOULD NOT USE
THE PUBLIC
WATER SUPPLY
AS A VEHICLE TO
ADMINISTER A
MEDICATION TO
THE POPULATION**

Fluoridation chemicals

NOT Regulated = NOT Safe

**Don't we deserve
to be
protected by
Government regulation?**

**Who determines safety and
efficacy of fluoridation chemicals ?**

NO ONE!

**NO Government Agency in Canada regulates
fluoridation chemicals.**

WHICH HEALTH AUTHORITIES CLAIM ACCOUNTABILITY FOR FLUORIDATION?

NONE...

NO ACCOUNTABILITY

It is not logical to accept the advice of those who accept no responsibility for these chemicals:

- Health Canada
- Ontario Ministry of Health
- Ontario Ministry of Environment
- Ontario Ministry of Health Promotion
- Ontario Dental Association
- And over 90 organisations who endorse fluoridation

Finally, who's Accountable?

Municipalities are legally responsible:

- You, the councillors, are the final decision makers
- for choosing fluoridation chemicals
- for adding fluoridation chemicals

Pleading ignorance of the law is not an excuse

False Assumptions

- **Tax payers incorrectly assume** that these products are compliant with Canadian laws,
- **Tax payers incorrectly assume** that these products have been assessed for safety,
- **Tax payers incorrectly assume** that the product reduces cavities when swallowed,
- **Taxpayers incorrectly assume** that the Health Canada panel evaluating these products had the necessary expertise,
- **Taxpayers incorrectly assume** that the Health Canada panel reviewed all available research – not just the research that supports the policy.

3 methods for Removing Fluoride

1. **Reverse Osmosis** – water wasteful, expensive to purchase and maintain.
2. **Distillation** – expensive to purchase, removes beneficial minerals, energy user
3. **Stop fluoridating** – simple and free

Which is easier?
Which is cheaper?
Which is logical?

MINISTRY OF HEALTH'S RESPONSE LETTER TO PEEL REGION

THE MINISTRY'S RESPONSE **DOES NOT ANSWER THE**
REGIONS RESOLUTION
REQUESTING TO ASSURE THE RESIDENTS
OF THE SAFETY AND EFFICACY OF HFSA
FOR THE SOLE PURPOSE OF
PREVENTING DENTAL CAVITIES
TO ALL RESIDENTS OF PEEL
BY USING AN UNAPPROVED DRUG TO
MEDICATE THE RESIDENTS
WITHOUT THEIR INFORMED CONSENT

MINISTRY OF HEALTH'S RESPONSE LETTER TO PEEL REGION

AS YOU HAVE NOW LEARNED, THE PROVINCE HAS
NOT PROVIDED THE ANSWERS TO YOU
IN ORDER FOR REGIONAL COUNCIL
TO REPORT BACK TO THE CONCERNED RESIDENTS OF PEEL
WHO HAVE BEEN ASKING FOR
PROOF OF SAFETY AND EFFICACY SINCE 2011
NO EVIDENCE OF SAFETY AND EFFICACY (NOT ENDORSEMENTS)
MEANS
YOU CANNOT CLAIM SAFETY AND EFFICACY
THEREFORE, THE INFORMATION YOU ARE RELYING ON FROM
PUBLIC OFFICIALS IS **INVALID** AS CLAIMS FOR
SAFETY AND EFFICACY OF HFSA
MUST BE BACKED UP BY REQUIRED TOXICOLOGICAL STUDIES
WHICH I HAVE CONFIRMED FOR YOU TODAY
DO NOT EXIST!

MINISTRY OF HEALTH'S RESPONSE LETTER TO PEEL REGION

THEREFORE, IT IS INCUMBENT UPON YOU, AS THE
ULTIMATE DECISION MAKERS,
TO PROTECT THE HEALTH AND WELL BEING OF THE RESIDENTS
YOU WERE ELECTED TO SERVE AND PROTECT.
PLEASE CEASE AND DISMISS THIS
UNREGULATED, UNTESTED, UNETHICAL, UNAPPROVED AND INEFFECTIVE PRACTICE
WITHOUT FURTHER DELAY!
ALL RESIDENTS OF PEEL HAVE THE RIGHT TO SAFE DRINKING WATER
WHICH IS A FUNDAMENTAL HUMAN RIGHT
PLEASE JOIN THE 95% OF THE WORLD THAT DOES NOT FLUORIDATE
REDIRECT \$500,000.00 SPENT ON THE INEFFECTIVE FLUORIDATION
INTO PUBLIC HEALTH DENTAL PROGRAMS OF PREVENTION

**WE HAVE PROVEN THAT
FLUORIDATION CHEMICALS ARE**

**UNREGULATED
UNTESTED
UNAPPROVED
INEFFECTIVE
DRUGS**

**THE PRECAUTIONARY PRINCIPAL
SHOULD BE APPLIED**

JOHN REMINGTON GRAHAM
COUNSELOR AT LAW



Important Documents for the Public Records

Community Water Fluoridation Committee Members & Regional Staff

**Judicial findings in three landmark cases in Pennsylvania, Illinois and Texas that
Artificial Water Fluoridation
causes cancer and other ailments in man.**

CWFC Meeting Thursday, July 5th, 2018
Peel Region, Ontario Canada

Submitted by Liesa Cianchino, Chair Concerned Residents of Peel to End Artificial Water Fluoridation on
behalf of John Remington Graham

SUMMARY OF DOCUMENTS

SHORT CURRICULUM VITAE JOHN REMINGTON GRAHAM

~

LETTER TO DR. DAVID KENNEDY DESCRIBING THE NATURE OF THE EVIDENCE

IN THE PENNSYLVANIA, ILLINOIS AND TEXAS TRIALS
REGARDING ARTIFICIAL WATER FLUORIDATION.

~

**HIGHLIGHTS IN NORTH AMERICAN LITIGATION
DURING THE TWENTIETH CENTURY ON
ARTIFICIAL FLUORIDATION OF PUBLIC WATER SUPPLIES
JOHN REMINGTON GRAHAM* AND PIERRE-JEAN MORIN****

~

STATEMENT OF DR. J. WILLIAM HIRZY

NATIONAL TREASURY EMPLOYEES UNION CHAPTER 280 BEFORE THE
SUBCOMMITTEE ON WILDLIFE, FISHERIES AND DRINKING WATER

UNITED STATES SENATE

JUNE 29, 2000

JOHN REMINGTON GRAHAM

COUNSELOR AT LAW

B. A. in philosophy 1963, LL. B. 1966, University of Minnesota; admitted to the Bar of the Minnesota Supreme Court, 1967; admitted to the Bar of the United States Supreme Court, 1971; Public Defender, United States District Court for Minnesota, 1969-1973; Founding professor, teaching common law pleading, judicial writs and remedies, American constitutional law, admiralty, copyrights, legal writing, conflict of laws, legal history, and modern civil procedure, and serving as chairman of the admissions committee, Hamline University School of Law, 1972-1980; Advisor on questions concerning constitutional law and equitable remedies to the Minnesota State Board of Bar Examiners, 1974-1978; Special Counsel for the City of Brainerd, 1974-1980; Crow Wing County Public Defender, 1981-1984; Crow Wing County Attorney, 1991-1995; Occasional lecturer in comparative British, American, and Canadian constitutional law at Laval University, 1989-1991, 1997, and 2000, and in public international law, 2003; and Advisor on British constitutional law and history to the court-appointed Amicus Curiae for Quebec before the Supreme Court of Canada in *Reference on certain Questions concerning the Secession of Quebec from Canada*, [1998] 2 S. C. R. 217.

JOHN REMINGTON GRAHAM

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January 14, 2015

Dr. David Kennedy

Dear Dr. Kennedy, --

You have recently requested that I restate the substance of the evidence presented for the plaintiffs in historic trials in Pennsylvania, Illinois, and Texas in 1978-1982, leading to judicial findings in all three cases, based on at least a fair preponderance of the evidence, that water fluoridation causes cancer and other ailments in man. The underlying forensic evidence, political and legal history, court trials, and the judicial findings have been written up by me and associates in two published works: J. R. Graham and Pierre Morin, *Highlights in North American Litigation During the Twentieth Century on Artificial Fluoridation of Public Water Supplies*, 14 *Journal of Land Use and Environmental Law* 195-248 (Florida State University, 1999), which is internet accessible, and the chapter on forensic medicine in Pierre Morin, J. R. Graham, and Gilles Parent, *Fluoridation: Autopsy of a Scientific Error*, Éditions Berger, Austin, Qc., 2010, which translates into English and updates an earlier edition of the same work in French, published in 2005.

The key court papers, including transcripts, pleadings, motions, summations of evidence, exhibits, recorded data, judicial findings, and court orders, opinions, and decrees, together with other legal items, and related medico-scientific material in these three cases, and in related litigation, have been archived at the Crow Wing County Historical Society in Brainerd, Minnesota, and by the Geosciences Department at the University of Massachusetts Amherst, and I have much of this material in my own professional records.

It is noteworthy that the union of scientists at the national headquarters of the United States Environmental Protection Agency reviewed the evidence presented during the trials in Pennsylvania, Illinois, and Texas, and pertinent evidence later published. During the review process, I was contacted by the epidemiology section at the national headquarters of the USEPA, because, as a specialist in forensic science and medicine, I appeared for the plaintiffs, conducted direct and cross-examination of all expert witnesses, and wrote summations of evidence in all three cases. Upon my experience and background, I sent a detailed report of the forensic evidence to the epidemiology section at the national headquarters of USEPA. Copies of this report, including appendices, are in the archives in Minnesota and Massachusetts, and in my professional records. The union of scientists at the national headquarters of the USEPA (i. e., the National Treasury Employees Union, Chapter 280) concluded that the judicial findings were scientifically warranted

and correct, as is stated on June 29, 2000, in an internet-accessible report by Dr. J. W. Hirzy, executive vice president of the union, to a subcommittee of the United States Senate.

The union maintains a website which includes several additional reports in more recent years including material from affiliate unions representing professional staff in USEPA offices across the country, and this material is confirmatory of, and adjunctive to the report of Dr. Hirzy before the United States Senate on June 29, 2000.

My purpose here is to describe for you the evidence presented in the court trials in Pennsylvania, Illinois, and Texas, leading to judicial findings that water fluoridation causes cancer and other ailments in man. It is striking that three veteran trial judges in three different States each heard substantially the same forensic evidence, that each acted independently of the others, and that each reached the same basic conclusion. Each trial had unique features, characterized by differences in civil practice and procedure, not to mention somewhat different political cross-currents, but there was a large overlapping of substantive exhibits and testimony in all three cases. While the trial of each case was unavoidably complex, the main evidence in all three cases followed the same basic pattern:

Our initial evidence in court consisted of expert testimony on large laboratory studies done by Dr. Alfred Taylor, a biochemist at the University of Texas, and by him published in peer-reviewed journals in 1954 (about 600 mice, which is huge by contemporary standards, and important because mice, like man, are mammals) and 1963 (about 900 mice) showing unmistakably that fluoride in drinking water (introduced as NaF, thereby resembling fluoride as artificially introduced in public water supplies) at various concentrations, including 1.0 part per million (the usual target level in water fluoridation), induces cancer-related reactions in laboratory mice. These studies have been directly or indirectly confirmed many times in peer-reviewed articles which have been published in good scientific journals, and which show that fluoride is a carcinogen, a mutagen, and an enzyme inhibitor. We showed that the United States Public Health Service and the American Dental Association had concealed the work of Dr. Taylor, by claiming publicly, contrary to known facts, that Dr. Taylor did not do necessary reruns, that his work was not peer-reviewed, that he never published his work, and that he never observed or reported positive results. This evidence was introductory, but it was impossible for the judges not to notice that pertinent laboratory studies were concealed by promoters of water fluoridation. **The laboratory studies were reinforced by medical evidence to the effect that free fluoride ions in drinking water can be transported by blood to and absorbed in all parts of the human body including soft tissues, are highly reactive, and can cause cancer in all parts of the human body.**

Having laid this foundation of laboratory data and general medical knowledge, our main evidence in all three cases was a huge epidemiological survey conceived and executed by a number of workers under the direction of Dr. Dean Burk, one of the most famous and decorated cancer research scientists in the world during the 20th century. His career at the National Cancer Institute of the United States spanned 35 years. This epidemiological evidence is especially important, because it translates general concern into actual experience of human beings in their natural environment. The survey compared cancer death rates in two large groups of American central cities, both spread out in all parts of the United States (an aggregate population of about 18 million in 1960), including the same size category and density of urban populations in both groups, from 1940 through 1950 during which both groups did not introduce water fluoridation, and then after 1950 during which ten cities introduced and maintained water fluoridation in 1952-1968

(represented by available data for 1953-1968), and the other ten did not introduce water fluoridation in 1952-1968 (represented by available data for 1953-1968). Before 1950, the cancer death rates remained about the same in both groups for all years observed. After 1950, the cancer death rates the experimental cities introducing water fluoridation in 1952-1968 grew much more rapidly than for the control cities which did not introduce water fluoridation in 1952-1968. **The association shown between water fluoridation and human cancer was slightly more than 300 excess cancer deaths every year per million persons drinking fluoridated water after 15-20 years of exposure.** The 1940-1950 base line served as a control for all known and unknown variables, including socio-economic, environmental, nutritional, and demographic factors. This association between water fluoridation and human cancer works out to about 30,000 excess cancer deaths every year for about 100 million drinking fluoridated water at the time the three cases were tried. At the moment, substantially more Americans are drinking fluoridated water, so the annual casualty is substantially more now. The proper interpretation of the combined impact of laboratory, medical, and epidemiological evidence presented on our side of the case follows basic rules of inductive logic stated by William of Ockham, Sir Francis Bacon, and Sir Isaac Newton.

In these trials, the government of the United States maintained that the data gathered and organized under the direction of Dr. Burk should be adjusted for age, race, and sex. Among our twenty cities, the factors of sex and race proved, upon close examination, not to be important, but age certainly was and is important because cancer has always been an age-prone disease, and there were certain interesting age-related demographic changes within the populations studied between 1940 and 1970. Although we believed that the 1940-1950 base line was a sufficient control for age and all other variables, we agreed that no harm would be done by appropriate demographic adjustments, and that these adjustments might be useful as a precaution. Thus, **in all three cases, the primary point in controversy was not whether, but how and why demographic adjustments should be done.** Statisticians engaged by the government of the United States claimed that, using a textbook procedure in modern applied epidemiology (the indirect method, weighted averages, a national standard, and forty age-race-sex categories), adjusted cancer death rates in 1950-1970 actually grew faster in the control cities that did not introduce water fluoridation, than in the experimental cities which did, -- so they claimed at any rate. Our witnesses then came forth with several alternative age-race-sex adjustments, but they conceded for the sake of discussion that the textbook procedure used by the government justified serious attention. **We proceeded to show, in each of the three trials, that the government workers had left out all or nearly all available and pertinent data in their adjustment, but that, when omitted data are included by standard statistical methods, there remains an enormous association between water fluoridation and human cancer,** -- in light of what is now known, about 200 excess cancer deaths every year per million persons drinking fluoridated water after 15-20 years of exposure, which still translates into a stupefying increase in cancer mortality in the United States, year after year.

In the wake of these court trials, an eminent researcher at an international meeting in 1986 offered plausible evidence to support his contention that changes in population size might explain the huge association between water fluoridation and human cancer displayed by the epidemiological survey carried out under the direction of Dr. Burk. Because of our great respect for this scientist, we reviewed our data once again, and then adjusted for changes in population size among our twenty cities. We discovered that changes in population size are an approximate inverse index of population aging, because a declining population includes fewer people of child-bearing age, and a population growing larger has more people of child-bearing age. And we discovered, in any event,

that a proper adjustment of changes in population size leaves an enormous association between water fluoridation and human cancer, -- an association slightly larger than the association which remains after a correctly executed adjustment for age, or what amounts to the same thing, for age, race, and sex. Our expanded and revised adjustments for age, race, and sex and for changes in population size, drawn from census data and vital statistics of the United States, were published for the record in 1988, with the participation and approval of Dr. Burk, in the proceedings of the Pennsylvania Academy of Science.

Since the cases in Pennsylvania, Illinois, and Texas were tried, new evidence has been generated, including laboratory work showing that there is a statistically significant, dose-dependent trend in fluoride-induced bone cancer in male rats, and this laboratory work has been borne out in several epidemiological studies which show an association between water fluoridation and bone cancer in human males. These studies are important, because they are confirmatory of the laboratory work pioneered by Dr. Taylor and the epidemiological work of Dr. Burk and his associates, with respect to a particular kind of cancer, and include examination of specific cases in clinical setting.

Particularly disturbing to the union of scientists at the national headquarters of the USEPA is the recent emergence of laboratory studies which show that fluoride exposure induces neurological injury in rats, and epidemiological evidence suggesting that fluoride in water may reduce IQ in children. A new report published by the National Institute of Environmental Health Sciences in 2012 concludes, "Our results support the possibility of adverse effects of fluoride exposures on children's neurodevelopment." If this suggestion holds up to closer scrutiny in due course, the ramifications for water fluoridation as a disaster in public health administration are almost unthinkable. Yet, if we dump an industrial waste product in public water supplies, and the main ingredient has been identified as a carcinogen, mutagen, and enzyme inhibitor, we should not be surprised to see, as is now sketched out as a concrete possibility from information now available, that the same product is not only associated with large increases in cancer mortality as already established in judicial proceedings, but maybe also lower intelligence in man. With this unhappy note, I remain

Respectfully yours,

Courtesy copies to the Crow Wing County Historical Society, the University of Massachusetts Amherst c/o Professor Michael Dolan, and Dr. J. W. Hirzy

<https://ir.law.fsu.edu/cgi/viewcontent.cgi?article=1195&context=jluel>



NTEU

The National Treasury Employees Union

CHAPTER 280
BEN FRANKLIN STATION
P.O. BOX 7672
WASHINGTON, DC 20044
202-566-2785(V)
202-566-1460(F)
Website www.nteu280.org

**STATEMENT OF Dr. J. WILLIAM HIRZY
NATIONAL TREASURY EMPLOYEES UNION CHAPTER 280
BEFORE THE
SUBCOMMITTEE ON WILDLIFE, FISHERIES AND DRINKING WATER
UNITED STATES SENATE
JUNE 29, 2000**

Good morning Mr. Chairman and Members of the Subcommittee. I appreciate the opportunity to appear before this Subcommittee to present the views of the union, of which I am a Vice-President, on the subject of fluoridation of public water supplies.

Our union is comprised of and represents the professional employees at the headquarters location of the U. S. Environmental Protection Agency in Washington D.C. Our members include toxicologists, biologists, chemists, engineers, lawyers and others defined by law as "professionals." The work we do includes evaluation of toxicity, exposure and economic information for management's use in formulating public health and environmental protection policy. I am not here as a representative of EPA, but rather as a representative of EPA headquarters professional employees, through their duly elected labor union. The union first got involved in this issue in 1985 as a matter of professional ethics. In 1997 we most recently voted to oppose fluoridation. Our opposition has strengthened since then.

Summary of Recommendations

- 1) We ask that you order an independent review of a cancer bioassay previously mandated by Congressional committee and subsequently performed by Battelle Memorial Institute with appropriate blinding and instructions that all reviewer's independent determinations be reported to this Committee.
- 2) We ask that you order that the two waste products of the fertilizer industry that are now used in 90% of fluoridation programs, for which EPA states they are not able to identify any chronic studies, be used in any future toxicity studies, rather than a substitute chemical. Further, since federal agencies are actively advocating that each man woman and child drink, eat and bathe in these chemicals, silicofluorides should be placed at the head of the list for establishing a MCL that complies with the Safe Drinking Water Act. This means that the MCL be protective of the most sensitive of our population, including infants, with an appropriate margin of safety for ingestion over an entire lifetime.
- 3) We ask that you order an epidemiology study comparing children with dental fluorosis to those not displaying overdose during growth and development years for behavioral and other disorders.
- 4) We ask that you convene a joint Congressional Committee to give the only substance that is being mandated for ingestion throughout this country the full hearing that it deserves.

National Review of Fluoridation The Subcommittee's hearing today can only begin to get at the issues surrounding the policy of water fluoridation in the United States, a massive experiment that has been run on the American public, without informed consent, for over fifty years. The last Congressional hearings on this subject

were held in 1977. Much knowledge has been gained in the intervening years. It is high time for a national review of this policy by a Joint Select Committee of Congress. New hearings should explore, at minimum, these points:

- 1) excessive and un-controlled fluoride exposures;
- 2) altered findings of a cancer bioassay;
- 3) the results and implications of recent brain effects research;
- 4) the "protected pollutant" status of fluoride within EPA;
- 5) the altered recommendations to EPA of a 1983 Surgeon General's Panel on fluoride;
- 6) the results of a fifty-year experiment on fluoridation in two New York communities;
- 7) the findings of fact in three landmark lawsuits since 1978;
- 8) the findings and implications of recent research linking the predominant fluoridation chemical with elevated blood-lead levels in children and anti-social behavior; and
- 9) changing views among dental researchers on the efficacy of water fluoridation

Fluoride Exposures Are Excessive and Un-controlled According to a study by the National Institute of Dental Research, 66 percent of America's children in fluoridated communities show the visible sign of over-exposure and fluoride toxicity, dental fluorosis (1). That result is from a survey done in the mid-1980's and the figure today is undoubtedly much higher.

Centers for Disease Control and EPA claim that dental fluorosis is only a "cosmetic" effect. God did not create humans with fluorosed teeth. That effect occurs when children ingest more fluoride than their bodies can handle with the metabolic processes we were born with, and their teeth are damaged as a result. And not only their teeth. Children's bones and other tissues, as well as their developing teeth are accumulating too much fluoride. We can see the effect on teeth. Few researchers, if any, are looking for the effects of excessive fluoride exposure on bone and other tissues in American children. What has been reported so far in this connection is disturbing. One example is epidemiological evidence (2a, 2b) showing elevated bone cancer in young men related to consumption of fluoridated drinking water.

Without trying to ascribe a cause and effect relationship beforehand, we do know that American children in large numbers are afflicted with hyperactivity-attention deficit disorder, that autism seems to be on the rise, that bone fractures in young athletes and military personnel are on the rise, that earlier onset of puberty in young women is occurring. There are biologically plausible mechanisms described in peer-reviewed research on fluoride that can link some of these effects to fluoride exposures (e.g. 3,4,5,6). Considering the economic and human costs of these conditions, we believe that Congress should order epidemiology studies that use dental fluorosis as an index of exposure to determine if there are links between such effects and fluoride over-exposure.

In the interim, while this epidemiology is conducted, we believe that a national moratorium on water fluoridation should be instituted. There will be a hue and cry from some quarters, predicting increased dental caries, but Europe has about the same rate of dental caries as the U.S. (7) and most European countries do not fluoridate (8). I am submitting letters from European and Asian authorities on this point. There are studies in the U.S. of localities that have interrupted fluoridation with no discernable increase in dental caries rates (e.g., 9). And people who want the freedom of choice to continue to ingest fluoride can do so by other means.

Cancer Bioassay Findings In 1990, the results of the National Toxicology Program cancer bioassay on sodium fluoride were published (10), the initial findings of which would have ended fluoridation. But a special commission was hastily convened to review the findings, resulting in the salvation of fluoridation through systematic down-grading of the evidence of carcinogenicity. The final, published version of the NTP report says that there is, "equivocal evidence of carcinogenicity in male rats," changed from "clear evidence of carcinogenicity in male rats."

The change prompted Dr. William Marcus, who was then Senior Science Adviser and Toxicologist in the Office of Drinking Water, to blow the whistle about the issue (22), which led to his firing by EPA. Dr. Marcus sued EPA, won his case and was reinstated with back pay, benefits and compensatory damages. I am submitting material from Dr. Marcus to the Subcommittee dealing with the cancer and neurotoxicity risks posed by fluoridation.

We believe the Subcommittee should call for an independent review of the tumor slides from the bioassay, as was called for by Dr. Marcus (22), with the results to be presented in a hearing before a Select Committee of the Congress. The scientists who conducted the original study, the original reviewers of the study, and the "review commission" members should be called, and an explanation given for the changed findings.

Brain Effects Research Since 1994 there have been six publications that link fluoride exposure to direct adverse effects on the brain. Two epidemiology studies from China indicate depression of I.Q. in children (11,12). Another paper (3) shows a link between prenatal exposure of animals to fluoride and subsequent birth of off-spring which are hyperactive throughout life. A 1998 paper shows brain and kidney damage in animals given the "optimal" dosage of fluoride, viz. one part per million (13). And another (14) shows decreased levels of a key substance in the brain that may explain the results in the other paper from that journal. Another publication (5) links fluoride dosing to adverse effects on the brain's pineal gland and pre-mature onset of sexual maturity in animals. Earlier onset of menstruation of girls in fluoridated Newburg, New York has also been reported (6).

Given the national concern over incidence of attention deficit-hyperactivity disorder and autism in our children, we believe that the authors of these studies should be called before a Select Committee, along with those who have critiqued their studies, so the American public and the Congress can understand the implications of this work.

Fluoride as a Protected Pollutant The classic example of EPA's protective treatment of this substance, recognized the world over and in the U.S. before the linguistic de-toxification campaign of the 1940's and 1950's as a major environmental pollutant, is the 1983 statement by EPA's then Deputy Assistant Administrator for Water, Rebecca Hanmer (15), that EPA views the use of hydrofluosilicic acid recovered from the waste stream of phosphate fertilizer manufacture as,

"...an ideal solution to a long standing problem. By recovering by-product fluosilicic acid (sic) from fertilizer manufacturing, water and air pollution are minimized, and water authorities have a low-cost source of fluoride..."

In other words, the solution to pollution is dilution, as long as the pollutant is dumped straight into drinking water systems and not into rivers or the atmosphere. I am submitting a copy of her letter.

Other Federal entities are also protective of fluoride. Congressman Calvert of the House Science Committee has sent letters of inquiry to EPA and other Federal entities on the matter of fluoride, answers to which have not yet been received.

We believe that EPA and other Federal officials should be called to testify on the manner in which fluoride has been protected. The union will be happy to assist the Congress in identifying targets for an inquiry. For instance, hydrofluosilicic acid does not appear on the Toxic Release Inventory list of chemicals, and there is a remarkable discrepancy among the Maximum Contaminant Levels for fluoride, arsenic and lead, given the relative toxicities of these substances.

Surgeon General's Panel on Fluoride We believe that EPA staff and managers should be called to testify, along with members of the 1983 Surgeon General's panel and officials of the Department of Human Services, to explain how the original recommendations of the Surgeon General's panel (16) were altered to allow EPA to set otherwise unjustifiable drinking water standards for fluoride.

Kingston and Newburg, New York Results In 1998, the results of a fifty-year fluoridation experiment involving Kingston, New York (un-fluoridated) and Newburg, New York (fluoridated) were published (17). In summary, there is no overall significant difference in rates of dental decay in children in the two cities, but children in the fluoridated city show significantly higher rates of dental fluorosis than children in the un-fluoridated city.

We believe that the authors of this study and representatives of the Centers For Disease Control and EPA should be called before a Select Committee to explain the increase in dental fluorosis among American children and

the implications of that increase for skeletal and other effects as the children mature, including bone cancer, stress fractures and arthritis.

Findings of Fact by Judges In three landmark cases adjudicated since 1978 in Pennsylvania, Illinois and Texas (18), judges with no interest except finding fact and administering justice heard prolonged testimony from proponents and opponents of fluoridation and made dispassionate findings of fact. I cite one such instance here.

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. Testimony in the case filled 2800 transcript pages and fully elucidated the benefits and risks of water fluoridation as understood in 1978. Judge Flaherty issued an injunction against fluoridation in the case, but the suit was discontinued on jurisdictional grounds. His findings of fact were not disturbed by appellate action. Judge Flaherty, in a July, 1979 letter to the Mayor of Auckland New Zealand wrote the following about the case:

"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...

"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."

In the 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."

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."

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.

Proponents of fluoridation are absolutely right about one thing: there is no real controversy about fluoridation when the facts are heard by an open mind.

I am submitting a copy of the excerpted letter from Judge Flaherty and another letter referenced in it that was sent to Judge Flaherty by Dr. Peter Sammartino, then Chancellor of Fairleigh Dickenson University. I am also submitting a reprint copy of an article in the Spring 1999 issue of the Florida State University Journal of Land Use and Environmental Law by John Remington Graham and Pierre Morin, entitled "Highlights in North American Litigation During the Twentieth Century on Artificial Fluoridation of Public Water. Mr. Graham was chief litigator in the case before Judge Flaherty and in the other two cases (in Illinois and Texas).

We believe that Mr. Graham should be called before a Select Committee along with, if appropriate, the judges in these three cases who could relate their experience as trial judges in these cases.

Hydrofluosilicic Acid There are no chronic toxicity data on the predominant chemical, hydrofluosilicic acid and its sodium salt, used to fluoridate American communities. Newly published studies (19) indicate a link between use of

these chemicals and elevated level of lead in children's blood and anti-social behavior. Material from the authors of these studies has been submitted by them independently.

We believe the authors of these papers and their critics should be called before a Select Committee to explain to you and the American people what these papers mean for continuation of the policy of fluoridation.

Changing Views on Efficacy and Risk In recent years, two prominent dental researchers who were leaders of the pro-fluoridation movement announced reversals of their former positions because they concluded that water fluoridation is not an effective means of reducing dental caries and that it poses serious risks to human health. The late Dr. John Colquhoun was Principal Dental Officer of Auckland, New Zealand, and he published his reasons for changing sides in 1997 (20). In 1999, Dr. Hardy Limeback, Head of Preventive Dentistry, University of Toronto, announced his change of views, then published a statement (21) dated April 2000. I am submitting a copy of Dr. Limeback's publications.

We believe that Dr. Limeback, along with fluoridation proponents who have not changed their minds, such as Drs. Ernest Newbrun and Herschel Horowitz, should be called before a Select Committee to testify on the reasons for their respective positions.

Thank you for your consideration, and I will be happy to take questions.

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JOHN REMINGTON GRAHAM

COUNSELOR AT LAW

WATER FLUORIDATION IS DUMPING AN INDUSTRIAL WASTE PRODUCT IN PUBLIC WATER SUPPLIES, NOT FOOD GRADE OR PHARMACEUTICAL GRADE, THE PRINCIPAL INGREDIENT OF WHICH HAS BEEN IDENTIFIED IN PEER REVIEWED LABORATORY STUDIES AS A CARCINOGEN, MUTAGEN, AND ENZYME INHIBITER.

JUDICIAL FINDINGS IN PENNSYLVANIA, ILLINOIS, AND TEXAS HAVE DETERMINED THAT WATER FLUORIDATION CAUSES CANCER AND OTHER AILMENTS IN MAN.

IT APPEARS FROM AVAILABLE FORENSIC EVIDENCE THAT, SINCE THE GOVERNMENT OF THE UNITED STATES ENDORSED IT IN 1951, EASILY A MILLION AMERICANS HAVE DIED OF CANCER CAUSED OR PROMOTED BY WATER FLUORIDATION.

IT IS NO SURPRISE THAT THE INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES HAS REPORTED RECENTLY THAT FLUORIDE MAY CAUSE NEUROLOGICAL INJURY IN MAN.»

**-- JOHN REMINGTON GRAHAM OF THE MINNESOTA BAR (#3664X),
JRGRAHAM@NOVICOMFUSION.COM, 418-888-5049**

AFFIDAVIT SUBMITTED BY JOHN REMINGTON GRAHAM

**To be read by Liesa Cianchino on Behalf of the
Concerned Residents of Peel to End Artificial Water Fluoridation
in lieu of Mr. Graham's presentation in person.**

COMMUNITY WATER FLUORIDATION COMMITTEE MEETING

Thursday, September 27th, 2018

1:30 p.m. - 3:00 p.m.

REGION OF PEEL HEADQUARTERS - PEEL CONFERENCE CENTRE

1st Floor of Suite B (Glass Building)

10 Peel Centre Drive, Brampton, Ontario

Phone: 905-791-7800 • Toll-free: 1-888-919-7800

(NOT Council Chambers due to technology upgrades)

ROOM CAPACITY 40 PEOPLE TO INCLUDE CWFC MEMBERS & STAFF

WE ARE NOW LIMITED TO ONLY 20-25 ATTENDEES

Please confirm your attendance ASAP - 905-467-2018

DOMINION OF CANADA

PROVINCE OF QUÉBEC

John Remington Graham, being first duly sworn on oath, deposes and says:

Yesterday morning, I was arranging my air travel to Toronto in anticipation of appearing personally before the community water fluoridation committee of the Peel Region in Ontario to speak on judicial findings on water fluoridation, when I encountered the after-effects of a minor stroke which I suffered last summer. My physician, Dr. Louis Grenier, has recommended that I undertake no further travel, and today my wife observed that my physical condition was not good enough for the trip. Sylvie is a former Crown prosecutor in Quebec, and served twelve years as mayor of our municipality. I am sorry that I cannot appear personally as planned.

Materials already submitted include copies of (1) my letter of January 14, 2015, to Dr. David Kennedy, including (2) a résumé of highlights in my career; (3) a law review article authored by Dr. Pierre Morin, an eminent Canadian medical research scientist, and myself, the same entitled *Highlights on North American Litigation during the Twentieth Century on Artificial Fluoridation of Public Water Supplies*, 14 *Journal of Land Use and Environmental Law* 195-248 (Florida State University, 1999); and (4) the report of the union of scientists at the United States Environmental Protection Agency on June 29, 2000, submitted by their executive vice president, Dr. J. W. Hirzy, to a subcommittee of the United States Senate. I affirm of my own knowledge that those materials correctly recite the facts, save for minor errors, including in particular that, in the year 2000, 161 million (not 130 million) Americans drank water fluoridated at one part per million. It may now be conservatively estimated from data discussed in the foregoing materials that a million or more persons in the United States have died of cancer induced or promoted by water fluoridation since the United States Public Health Service

endorsed such measure in 1951, and Congress has since spent millions of dollars every year to promote it. I might here mention that the National Institute of Environmental Health Sciences has in 2012 and again 2017 published large and impressive studies which suggest that fluoride in public drinking water may cause neurological injury to man, including lower IQ in children. This recent work on neurological injury is of high quality, but is not yet as well developed as the work on fluoridation-caused cancer already found in judicial findings which I secured before veteran trial judges after historic trials in Pennsylvania, Illinois, and Texas, as reported in the law review article already provided. I should say that the evidence we presented before judicial tribunals in three States was somewhat understated at the time presented in court, but the casualty in cancer mortality is now known to be substantially greater than we originally thought. If the community water fluoridation committee wishes to inquire on details, I invite questions which I shall address by affidavit from evidence in my files, including detailed adjustments of epidemiological surveys done by Dr. Dean Burk, one of the most decorated and famous cancer research scientists in the world during the 20th Century.

I summarize salient points: I have practiced law, as a member of the Minnesota Bar (#3664X) over fifty years, including appearances before courts of record in sixteen jurisdictions of the United States, and service as a public defender, a law professor, and a chief public prosecutor in Minnesota, not to mention consultation in major litigation in Canada. I have studied Canadian constitutional law and history at Laval University under Professor Henri Brun, who was at the time the leading French-speaking constitutional lawyer in Canada. I can say from my experience in presenting forensic evidence on water fluoridation in Pennsylvania, Illinois, and Texas that **it is now possible to prove by fair preponderance of the evidence in judicial proceedings before courts of superior jurisdiction in the United States or Canada that**

water fluoridation causes large-scale cancer and other ailments in man. I can predict the outcomes in future judicial proceedings, first, because the United States Public Health Service, supported by the American Dental Association, covered up large laboratory studies proving that fluoride in drinking water at 1.0 part per million, introduced as sodium fluoride so as to resemble fluoride treatment of public water supplies, is a carcinogen, capable of producing significant cancer-related reactions in mice. Secondly, the United States National Cancer Institute has attempted to adjust massive epidemiological surveys of twenty large central cities for age, race, and sex, but did so by leaving out all or nearly all available and pertinent data, which, when included by standard statistical methods, shows a huge association of human cancer mortality with water fluoridation, -- something on the order of 200 excess cancer deaths per million persons exposed after 15-20 years of exposure. The actual casualty, established by the unadjusted data, already controlled for known and known variables by a long base line, is probably half again as great.

I have studied Canadian decisions on health freedom, and the most telling are *Toronto v. Forest Hill*, [1957] S. C. R. 569, and *Chaoulli v. Québec*, [2005] 1 S. C. R. 791. In light of these Canadian decisions and *Jacobson v. Massachusetts*, 197 U. S. 11 at 39 (1905), it appears that the Supreme Court and superior courts of Canada would hold that water fluoridation cannot be imposed on citizens who can establish on the face of the pleadings or can prove by fair preponderance of the evidence that water fluoridation causes harm to human health, as veteran trial judges have already found in Pennsylvania, Illinois, and Texas. As revealed on pages 237 and 238 of the law review article already provided, Judge Anthony Farris of the District Court of Texas found that the **“artificial fluoridation of public water supplies may cause or contribute to the cause of cancer, genetic damage, intolerant reactions, and**

chronic toxicity, including dental mottling in man; may aggravate malnutrition and existing illnesses in man; and is in some doubt as to the reduction of tooth decay in man.”

The Texas Court of Appeals upheld these findings based on a fair preponderance of the evidence. The report of Dr. Hirzy in behalf of the union of scientists at the USEPA confirms on page 4 that these judicial findings are scientifically correct. Similar findings were entered after long trials by Judge John Flaherty, later Chief Justice of the Pennsylvania Supreme Court, and Judge Ronald Niemann of the Circuit Court of Illinois. The public officers of the Peel Region who must decide whether to impose water fluoridation over the protest of their fellow citizens are presumed know and understand the dangers which the foregoing materials portray, and will sooner or later be answerable one way or another for their decisions. They will have no excuse for harm done if they rely on advice of bureaucrats who have not studied the forensic evidence, or misrepresent their qualifications.

/s/ John Remington Graham

John Remington Graham

12th

Sworn and subscribed before me on this _____ day of September, 2018

/s/ Sylvie Fortin

Sylvie Fortin, Member of the Bar (retired), and
Commissioner for the Taking of Oaths,
Dominion of Canada, Province of Québec

Court File No.

CV 14-4360-00

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LIESA CIANCHINO

Plaintiff

and

**HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF ONTARIO and
THE REGIONAL MUNICIPALITY OF PEEL**

Defendants



STATEMENT OF CLAIM

TO THE DEFENDANTS:

A LEGAL PROCEEDING HAS BEEN COMMENCED AGAINST YOU by the plaintiff. The claim made against you is set out in the following pages.

IF YOU WISH TO DEFEND THIS PROCEEDING, you or an Ontario lawyer acting for you must prepare a statement of defence in Form 18A prescribed by the Rules of Civil Procedure, serve it on the plaintiff's lawyer or, where the plaintiff does not have a lawyer, serve it on the plaintiff, and file it, with proof of service, in this court office, WITHIN TWENTY DAYS after this statement of claim is served on you, if you are served in Ontario.

If you are served in another province or territory of Canada or in the United States of America, the period for serving and filing your statement of defence is forty days. If you are served outside Canada and the United States of America, the period is sixty days.

Instead of serving and filing a statement of defence, you may serve and file a notice of intent to defend in Form 18B prescribed by the Rules of Civil Procedure. This will entitle you to ten more days within which to serve and file your statement of defence.

IF YOU FAIL TO DEFEND THIS PROCEEDING, JUDGMENT MAY BE GIVEN AGAINST YOU IN YOUR ABSENCE AND WITHOUT FURTHER NOTICE TO YOU. If you wish to defend this proceeding but are unable to pay legal fees, legal aid may be available to you by contacting a local legal aid office.

Date: September 25, 2014

Issued by



Local registrar

Address of court office:
7755 Hurontario Street
Brampton, ON L6W 4T6

Samantha Moeller

TO:

**HER MAJESTY THE QUEEN IN RIGHT OF
THE PROVINCE OF ONTARIO**

Crown Law Office – Civil Law
720 Bay Street, 8th Floor
Toronto, ON M5G 2K1

REGIONAL MUNICIPALITY OF PEEL

10 Peel Centre Drive
Suite A and B
Brampton, ON L6T 4B9

CLAIM

1. The plaintiff Liesa Cianchino (hereinafter, the "Plaintiff") claims:
 - (i) a declaration that the *Fluoridation Act*, R.S.O. 1990, c. F.22 violates s. 7 of the *Canadian Charter of Rights and Freedoms* and is of no force or effect under s. 52(1) of the *Constitution Act, 1982*;
 - (ii) a declaration that the Regional Municipality of Peel's artificial water fluoridation program violates s. 7 of the *Canadian Charter of Rights and Freedoms*;
 - (iii) a declaration that the Regional Municipality of Peel's artificial water fluoridation program violates the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32;
 - (iv) a declaration that the Regional Municipality of Peel's artificial water fluoridation program violates the *Food and Drugs Act*, R.S.C., 1985, c. F-27;
 - (v) a declaration that the Regional Municipality of Peel was negligent in its failure to ensure the safety of municipal drinking water;
 - (vi) a permanent injunction prohibiting and restraining the Regional Municipality of Peel from artificially fluoridating drinking water in municipal water supplies;
 - (vii) damages for negligence in the amount of \$500,000;
 - (viii) damages under s. 24(1) of the *Canadian Charter of Rights and Freedoms* in the amount of \$100,000;
 - (ix) pre-judgment and post-judgment interest pursuant to the *Courts of Justice Act*, R.S.O. 1990, c.C-43, as amended;
 - (x) costs of this action, together with applicable Harmonized Sales Tax thereon; and
 - (xi) such further and other relief as this Honourable Court may deem just.

OVERVIEW

2. This is an action to end the artificial fluoridation of municipal drinking water in the Regional Municipality of Peel (the “Region”) and in Ontario.

3. Fluoride is the anionic or reduced form of fluorine and is the thirteenth most abundant element in the Earth’s crust. Given that fluorine is so abundant, it is not surprising that fluoride compounds are components of minerals in rocks and soil. Due to these components, and the action of ground water acting upon them, fluoride is released into the groundwater and is the major contributor to the small amounts of fluoride present in most water sources. In general, most ground water contains low concentrations of fluoride, typically less than 0.5 mg/L.

4. “Fluoridation” or “artificial fluoridation” is the controlled addition of fluoride ions to drinking water that has a low fluoride concentration. The purpose of artificial fluoridation is to improve dental health.

5. Approximately 45% of Canadians drink fluoridated drinking water. However, the figures vary significantly across the country. In Quebec, less than 3% of the population drinks fluoridated water. Only approximately 3.7% of residents of British Columbia drinks fluoridated water. By contrast, over 70% of Ontario residents drinks fluoridated drinking water.

6. Canada’s rate of fluoridation puts it squarely in the global middle among the Organization of Economic and Cooperative Development (“OECD”) countries. Approximately 69% of U.S. residents live in communities with fluoridated water. By contrast, only approximately 3% of the population in Western Europe currently consumes

fluoridated water. Despite this fact, the available evidence does not suggest that tooth decay rates are higher in unfluoridated Western European countries than in the United States or other fluoridated countries.

7. While artificial fluoridation was initially believed to be an important contributor in reducing tooth decay, more recent evidence shows that the benefits of fluoridation — to the extent they exist at all — are grossly disproportionate to the potential deleterious effects. There is significant scientific evidence of harm caused by fluoridation, including dental fluorosis, muskoskeletal fluorosis, adverse cognitive and behavioural effects, and bone cancer.

THE PARTIES

8. The Plaintiff Liesa Cianchino has been a resident of Mississauga, Ontario for over 35 years. She is a cancer survivor. She is presently the Chairperson of Concerned Residents of Peel to End Water Fluoridation, a Founding Member of the Worldwide Alliance to End Fluoridation, and a Board Member of Mothers Against Fluoridation.

9. The defendant, Her Majesty the Queen in Right of the Province of Ontario, is named in these proceedings pursuant to the provisions in the *Proceedings Against the Crown Act*, R.S.O. 1990, C. P. 27, and amendments thereto.

10. The defendant Region is a regional municipality in Southern Ontario. It consists of three municipalities to the west and northwest of Toronto: the City of Brampton, the City of Mississauga, and the Town of Caledon.

11. The Region is the operating authority of the municipal drinking water supply for the City of Brampton, the City of Mississauga, and the Town of Caledon. It is licensed by the

Province of Ontario to supply drinking water to the residents of Peel pursuant to the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32.

WATER FLUORIDATION IN THE REGIONAL MUNICIPALITY OF PEEL

12. In 1961, the Province of Ontario enacted the *Fluoridation Act*, R.S.O. 1990, c. F.22, which specifically provided for the establishment and maintenance of fluoridation of drinking water within the Ontario waterworks system. The *Fluoridation Act* was the Ontario Legislature's response to the Supreme Court of Canada's 1957 opinion in *Toronto (Metro) v. Forest Hill (Village)*, [1957] S.C.R. 569. In that decision, the Supreme Court held that a by-law authorizing fluoridation of the municipality's drinking water was *ultra vires* the municipality's authority because the municipality's enabling statute only permitted the municipality to ensure an "abundant supply of pure and wholesome water", whereas the addition of fluoride was a form of mass medication.

13. The *Fluoridation Act* does not require municipalities to fluoridate drinking water. Under the Act, municipalities were given the discretionary authority, by way of the passing of a by-law "...to establish, maintain and operate, or require that the local board establish, maintain and operate, a fluoridation system in connection with the waterworks system."

14. Under the *Fluoridation Act*, cities that already had a fluoridation program in place at the time the Act was enacted were not required to pass a new by-law; the *Fluoridation Act* permitted the continuation of those programs.

15. Accordingly, the *Fluoridation Act* permitted the continuing fluoridation of the water supplies of the City of Mississauga and City of Brampton, which already had fluoridation

programs in place in 1961. In 2007, the Region passed a by-law establishing a fluoridation program in the Town of Caledon.

16. On June 26, 2014, the Plaintiff made submissions to Peel Regional Council concerning the dangers of artificial water fluoridation and advised the Council that she would seek judicial relief if the Council did not address this issue. The Council voted to adjourn consideration of the matter to September 11, 2014 pending legal advice from the Region's Solicitor.

17. On September 11, 2014, the Council received the opinion of its Solicitor during an *in camera* session of Council. Subsequently, during an open session of Council, the Peel Regional Council voted to defer dealing with the question of water fluoridation until after the municipal elections in October 2014.

HARM CAUSED BY ARTIFICIAL WATER FLUORIDATION

18. There is significant scientific and medical evidence of harm caused by fluoridation.

Dental Fluorosis

19. Fluoridation causes "dental fluorosis", which is a dose-related mottling of the enamel of the teeth that can range from mild discoloration of the tooth surface to severe staining and pitting. The condition is permanent after it develops in children during tooth formation. Severe fluorosis can lead to enamel loss, leaving the dentin open to decay and infection and causing structural damage to the tooth.

Muskoskeletal Effects

20. Skeletal fluorosis is a bone and joint condition associated with prolonged exposure to high concentrations of fluoride. Fluoride increases bone density and exacerbates the growth of osteophytes present in the bone and joints, resulting in joint stiffness and pain. Fluoride also increases the risk of bone fractures.

Neurobehavioural Effects

21. Fluorides increase the production of free radicals in the brain through several different biological pathways. These changes can increase the risk of developing Alzheimer's disease and other neurological diseases.

Genotoxicity and Carcinogenicity

22. Osteosarcoma is cancer of the bone. Peer-reviewed studies show that fluoride increases the risk of Osteosarcoma, particularly among children who are exposed to fluoride at a young age.

THE USE OF FLUOROSILICIC ACID

23. The Region uses fluorosilicic acid to fluoridate its drinking water. Fluorosilicic acid is a waste product that is created in the manufacture of wet-process phosphoric acid and other phosphate fertilizers. When fluorosilicic acid is in its gaseous form, it is a highly toxic substance.

24. Fluorosilicic acid contains numerous contaminants, including heavy metals such as lead and chromium, nonmetals such as arsenic, and even trace amounts of radioactive isotopes.

25. The U.S. Environmental Protection Agency sets the ideal safety goal for arsenic in drinking water at zero because arsenic is a known human carcinogen.

26. There are no known toxicological studies regarding the safety of using fluorosilicic acid to fluoridate water.

LACK OF EVIDENCE OF BENEFITS OF WATER FLUORIDATION

27. The purpose of fluoridation is to reduce dental caries (tooth decay). The Plaintiff pleads, however, that other factors, including diet, modern dental care, regular trips to the dentist and the availability of fluoridated toothpaste, are more meaningful means of reducing tooth decay and that water fluoridation is both harmful and unnecessary.

28. Fluoride's predominant mechanism of action is topical, not systemic. To the extent that fluoride works, it does so via direct exposure to the tooth and not from inside the body, rendering ingestion through drinking water unnecessary.

DUTY OF CARE OWED BY THE REGION OF PEEL TO THE PLAINTIFF

29. At all material times, the Region owed duties to the Plaintiff which include, but are not limited to, a duty to ensure the safety of the Region's drinking water supply.

30. In addition to owing a common law duty of care to the Plaintiff, the *Safe Drinking Water Act, 2002* imposes a statutory duty of care. Under this standard, municipalities must

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.

31. Further, section 20 of the *Safe Drinking Water Act, 2002* provides that “[n]o person shall cause or permit any thing to enter a drinking water system if it could result in ... a drinking water health hazard....” or “is a contravention of a prescribed standard.”

32. Section 4 of the *Food and Drugs Act* prohibits the sale of articles of food or drink that “has in or on it any poisonous or harmful substance.”

33. The provisions of the Ontario *Safe Drinking Water Act, 2002* and the federal *Food and Drugs Act* inform the common law duty of care.

34. The reasonable standard of care expected in the circumstances required the Region to:
- (a) engage in meaningful consultation with experts concerning the safety and risks of water fluoridation;
 - (b) conduct or commission a toxicological study on fluorosilicic acid to ensure its safety;
 - (c) ensure that the fluoridating agent used to fluoridate municipal drinking water supplies does not contain contaminants;
 - (d) ensure that information about water fluoridation provided to the public is accurate and balanced; and

- (e) 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.

BREACH OF THE STANDARD OF CARE

35. By failing to perform the duties enumerated in paragraph 34, the Region has breached the standard of care.

SECTION 7 OF *CHARTER* – NO CONSENT TO MEDICATION

36. Section 7 of the *Canadian Charter and Rights and Freedoms* provides that “Everyone has 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.”

37. The right not to be subject to medical treatment without informed consent is protected under s. 7 of the *Charter*. Section 7 protects the right to be free from unwanted medical treatment.

38. Artificial fluoridation infringes the s. 7 right to security of the person of the Plaintiff in a manner that is inconsistent with the principles of fundamental justice. Artificial fluoridation of drinking water is a form of mass medication imposed by the defendants. Without informed consent, the Region’s fluoridation program violates s. 7 of the *Charter*.

SECTION 7 OF THE *CHARTER* – GROSS DISPROPORTIONALITY

39. It is a principle of fundamental justice that a law which engages life, liberty or security of the person must not be grossly disproportionate. A law is grossly disproportionate where its benefits are grossly disproportionate to its potential harm.

40. The risk of significant harm caused by fluoridation is grossly disproportionate to the speculative benefit of reduced dental caries. Claimed reduction in tooth decay over the past several decades is more likely attributable to improved dental care rather than fluoridated water. As such, the benefits of fluoridated water are, at best, marginal, or, at worst, non-existent.

41. By contrast, the negative effects of fluoridation appear to be real and substantial, including, *inter alia*, dental fluorosis, adverse cognitive developmental effects, musculoskeletal fluorosis, and osteosarcoma.

42. It is reckless to expose residents to the risk of these serious adverse health effects for the marginal benefit of reduced tooth decay, particularly given that it is doubtful that fluoridated drinking water is even a significant contributor to reduced tooth decay.

DAMAGES SUFFERED BY THE PLAINTIFF

43. The defendants knew, or ought to have known, that as a consequence of their negligence, the Plaintiff would suffer damages as a result of being exposed to the risk of serious health effects.

44. In addition, an award of damages under s. 24(1) of the *Charter* (“*Charter* damages”) is appropriate and just in the circumstances.

45. An award of *Charter* damages would vindicate the rights of the Plaintiff and would provide a measure of compensation for having exposed the Plaintiff to the risk of serious adverse health effects of drinking fluoridated drinking water.

46. An award of *Charter* damages would also achieve the goal of deterring municipalities from: (a) engaging in forms of mass medication of residents without informed consent; and (b) adopting public health measures where the potential adverse consequences are grossly disproportionate to the benefits.

47. The Plaintiff pleads that there are no countervailing factors weighing against an award of *Charter* damages. No other remedies will adequately meet the need for compensation, vindication and deterrence.

48. The Plaintiff proposes that this action be tried at Brampton.

Date: September 25, 2014

RUBY SHILLER CHAN HASAN
Barristers
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Counsel for the Plaintiff

Court File No.

03-14-43600

LIESA CIANCHINO

and

**HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF
ONTARIO and THE REGIONAL MUNICIPALITY OF PEEL**

Plaintiff

Defendants

ONTARIO
SUPERIOR COURT OF JUSTICE
Proceedings commenced at Brampton

STATEMENT OF CLAIM

RUBY SHILLER CHAN HASAN
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January 14, 2015

Dr. David Kennedy

Dear Dr. Kennedy, --

You have recently requested that I restate the substance of the evidence presented for the plaintiffs in historic trials in Pennsylvania, Illinois, and Texas in 1978-1982, leading to judicial findings in all three cases, based on at least a fair preponderance of the evidence, that water fluoridation causes cancer and other ailments in man. The underlying forensic evidence, political and legal history, court trials, and the judicial findings have been written up by me and associates in two published works: J. R. Graham and Pierre Morin, *Highlights in North American Litigation During the Twentieth Century on Artificial Fluoridation of Public Water Supplies*, 14 *Journal of Land Use and Environmental Law* 195-248 (Florida State University, 1999), which is internet accessible, and the chapter on forensic medicine in Pierre Morin, J. R. Graham, and Gilles Parent, *Fluoridation: Autopsy of a Scientific Error*, Éditions Berger, Austin, Qc., 2010, which translates into English and updates an earlier edition of the same work in French, published in 2005.

The key court papers, including transcripts, pleadings, motions, summations of evidence, exhibits, recorded data, judicial findings, and court orders, opinions, and decrees, together with other legal items, and related medico-scientific material in these three cases, and in related litigation, have been archived at the Crow Wing County Historical Society in Brainerd, Minnesota, and by the Geosciences Department at the University of Massachusetts Amherst, and I have much of this material in my own professional records.

It is noteworthy that the union of scientists at the national headquarters of the United States Environmental Protection Agency reviewed the evidence presented during the trials in Pennsylvania, Illinois, and Texas, and pertinent evidence later published. During the review process, I was contacted by the epidemiology section at the national headquarters of the USEPA, because, as a specialist in forensic science and medicine, I appeared for the plaintiffs, conducted direct and cross-examination of all expert witnesses, and wrote summations of evidence in all three cases. Upon my experience and background, I sent a detailed report of the forensic evidence to the epidemiology section at the national headquarters of USEPA. Copies of this report, including appendices, are in the archives in Minnesota and Massachusetts, and in my professional records. The union of scientists at the national headquarters of the USEPA (i. e., the National Treasury Employees Union, Chapter 280) concluded that the judicial findings were scientifically warranted

and correct, as is stated on June 29, 2000, in an internet-accessible report by Dr. J. W. Hirzy, executive vice president of the union, to a subcommittee of the United States Senate.

The union maintains a website which includes several additional reports in more recent years including material from affiliate unions representing professional staff in USEPA offices across the country, and this material is confirmatory of, and adjunctive to the report of Dr. Hirzy before the United States Senate on June 29, 2000.

My purpose here is to describe for you the evidence presented in the court trials in Pennsylvania, Illinois, and Texas, leading to judicial findings that water fluoridation causes cancer and other ailments in man. It is striking that three veteran trial judges in three different States each heard substantially the same forensic evidence, that each acted independently of the others, and that each reached the same basic conclusion. Each trial had unique features, characterized by differences in civil practice and procedure, not to mention somewhat different political cross-currents, but there was a large overlapping of substantive exhibits and testimony in all three cases. While the trial of each case was unavoidably complex, the main evidence in all three cases followed the same basic pattern:

Our initial evidence in court consisted of expert testimony on large laboratory studies done by Dr. Alfred Taylor, a biochemist at the University of Texas, and by him published in peer-reviewed journals in 1954 (about 600 mice, which is huge by contemporary standards, and important because mice, like man, are mammals) and 1963 (about 900 mice) showing unmistakably that fluoride in drinking water (introduced as NaF, thereby resembling fluoride as artificially introduced in public water supplies) at various concentrations, including 1.0 part per million (the usual target level in water fluoridation), induces cancer-related reactions in laboratory mice. These studies have been directly or indirectly confirmed many times in peer-reviewed articles which have been published in good scientific journals, and which show that fluoride is a carcinogen, a mutagen, and an enzyme inhibitor. We showed that the United States Public Health Service and the American Dental Association had concealed the work of Dr. Taylor, by claiming publicly, contrary to known facts, that Dr. Taylor did not do necessary reruns, that his work was not peer-reviewed, that he never published his work, and that he never observed or reported positive results. This evidence was introductory, but it was impossible for the judges not to notice that pertinent laboratory studies were concealed by promoters of water fluoridation. **The laboratory studies were reinforced by medical evidence to the effect that free fluoride ions in drinking water can be transported by blood to and absorbed in all parts of the human body including soft tissues, are highly reactive, and can cause cancer in all parts of the human body.**

Having laid this foundation of laboratory data and general medical knowledge, our main evidence in all three cases was a huge epidemiological survey conceived and executed by a number of workers under the direction of Dr. Dean Burk, one of the most famous and decorated cancer research scientists in the world during the 20th century. His career at the National Cancer Institute of the United States spanned 35 years. This epidemiological evidence is especially important, because it translates general concern into actual experience of human beings in their natural environment. The survey compared cancer death rates in two large groups of American central cities, both spread out in all parts of the United States (an aggregate population of about 18 million in 1960), including the same size category and density of urban populations in both groups, from 1940 through 1950 during which both groups did not introduce water fluoridation, and then after 1950 during which ten cities introduced and maintained water fluoridation in 1952-1968

(represented by available data for 1953-1968), and the other ten did not introduce water fluoridation in 1952-1968 (represented by available data for 1953-1968). Before 1950, the cancer death rates remained about the same in both groups for all years observed. After 1950, the cancer death rates the experimental cities introducing water fluoridation in 1952-1968 grew much more rapidly than for the control cities which did not introduce water fluoridation in 1952-1968. **The association shown between water fluoridation and human cancer was slightly more than 300 excess cancer deaths every year per million persons drinking fluoridated water after 15-20 years of exposure.** The 1940-1950 base line served as a control for all known and unknown variables, including socio-economic, environmental, nutritional, and demographic factors. This association between water fluoridation and human cancer works out to about 30,000 excess cancer deaths every year for about 100 million drinking fluoridated water at the time the three cases were tried. At the moment, substantially more Americans are drinking fluoridated water, so the annual casualty is substantially more now. The proper interpretation of the combined impact of laboratory, medical, and epidemiological evidence presented on our side of the case follows basic rules of inductive logic stated by William of Ockham, Sir Francis Bacon, and Sir Isaac Newton.

In these trials, the government of the United States maintained that the data gathered and organized under the direction of Dr. Burk should be adjusted for age, race, and sex. Among our twenty cities, the factors of sex and race proved, upon close examination, not to be important, but age certainly was and is important because cancer has always been an age-prone disease, and there were certain interesting age-related demographic changes within the populations studied between 1940 and 1970. Although we believed that the 1940-1950 base line was a sufficient control for age and all other variables, we agreed that no harm would be done by appropriate demographic adjustments, and that these adjustments might be useful as a precaution. **Thus, in all three cases, the primary point in controversy was not whether, but how and why demographic adjustments should be done.** Statisticians engaged by the government of the United States claimed that, using a textbook procedure in modern applied epidemiology (the indirect method, weighted averages, a national standard, and forty age-race-sex categories), adjusted cancer death rates in 1950-1970 actually grew faster in the control cities that did not introduce water fluoridation, than in the experimental cities which did, -- so they claimed at any rate. Our witnesses then came forth with several alternative age-race-sex adjustments, but they conceded for the sake of discussion that the textbook procedure used by the government justified serious attention. **We proceeded to show, in each of the three trials, that the government workers had left out all or nearly all available and pertinent data in their adjustment, but that, when omitted data are included by standard statistical methods, there remains an enormous association between water fluoridation and human cancer,** -- in light of what is now known, about 200 excess cancer deaths every year per million persons drinking fluoridated water after 15-20 years of exposure, which still translates into a stupefying increase in cancer mortality in the United States, year after year.

In the wake of these court trials, an eminent researcher at an international meeting in 1986 offered plausible evidence to support his contention that changes in population size might explain the huge association between water fluoridation and human cancer displayed by the epidemiological survey carried out under the direction of Dr. Burk. Because of our great respect for this scientist, we reviewed our data once again, and then adjusted for changes in population size among our twenty cities. We discovered that changes in population size are an approximate inverse index of population aging, because a declining population includes fewer people of child-bearing age, and a population growing larger has more people of child-bearing age. And we discovered, in any event,

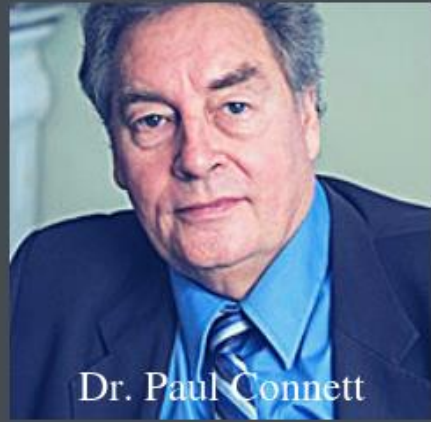
that a proper adjustment of changes in population size leaves an enormous association between water fluoridation and human cancer, -- an association slightly larger than the association which remains after a correctly executed adjustment for age, or what amounts to the same thing, for age, race, and sex. Our expanded and revised adjustments for age, race, and sex and for changes in population size, drawn from census data and vital statistics of the United States, were published for the record in 1988, with the participation and approval of Dr. Burk, in the proceedings of the Pennsylvania Academy of Science.

Since the cases in Pennsylvania, Illinois, and Texas were tried, new evidence has been generated, including laboratory work showing that there is a statistically significant, dose-dependent trend in fluoride-induced bone cancer in male rats, and this laboratory work has been borne out in several epidemiological studies which show an association between water fluoridation and bone cancer in human males. These studies are important, because they are confirmatory of the laboratory work pioneered by Dr. Taylor and the epidemiological work of Dr. Burk and his associates, with respect to a particular kind of cancer, and include examination of specific cases in clinical setting.

Particularly disturbing to the union of scientists at the national headquarters of the USEPA is the recent emergence of laboratory studies which show that fluoride exposure induces neurological injury in rats, and epidemiological evidence suggesting that fluoride in water may reduce IQ in children. A new report published by the National Institute of Environmental Health Sciences in 2012 concludes, "Our results support the possibility of adverse effects of fluoride exposures on children's neurodevelopment." If this suggestion holds up to closer scrutiny in due course, the ramifications for water fluoridation as a disaster in public health administration are almost unthinkable. Yet, if we dump an industrial waste product in public water supplies, and the main ingredient has been identified as a carcinogen, mutagen, and enzyme inhibitor, we should not be surprised to see, as is now sketched out as a concrete possibility from information now available, that the same product is not only associated with large increases in cancer mortality as already established in judicial proceedings, but maybe also lower intelligence in man. With this unhappy note, I remain

Respectfully yours,

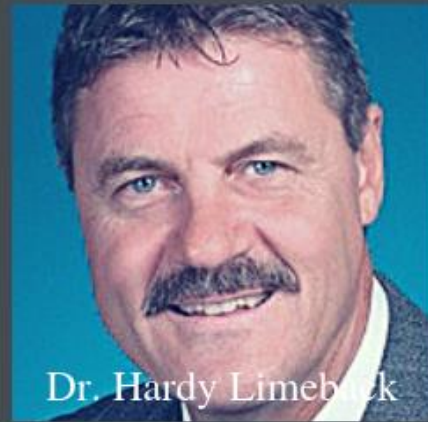
Courtesy copies to the Crow Wing County Historical Society, the University of Massachusetts Amherst c/o Professor Michael Dolan, and Dr. J. W. Hirzy



Dr. Paul Connett



THE EXPERTS
IN THE CASE AGAINST
ARTIFICIAL WATER FLUORIDATION



Dr. Hardy Limeback



Dr. A. K. Susheela



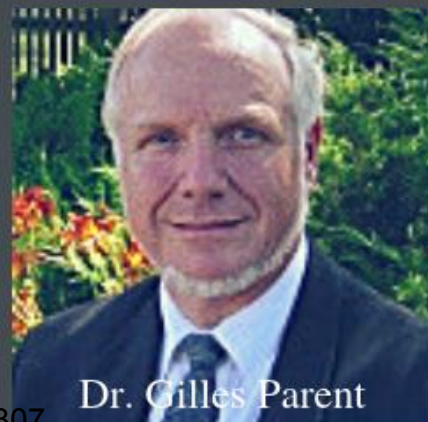
Dr. Kathleen Thiessen



John Remington Graham



Lawyer Nader Hasan



Dr. Gilles Parent

ARTIFICIAL WATER FLUORIDATION

PRESENTATION TO CIVIC WORKS COMMITTEE

Tuesday, February 5, 2019

Presented by Liesa Cianchino
Chair Concerned Residents of Peel to
End Artificial Water Fluoridation

MEMORANDUM

TO: Liesa Cianchino, *Chair of Concerned Residents of Peel to End Fluoridation*

FROM: Nader R. Hasan

DATE: June 23, 2014

RE: Legal Arguments Against Artificial Water Fluoridation

SUMMARY AND OPINION

You have asked me to provide an opinion on the lawfulness of the Region of Peel's fluoridation program. In short, if an Ontario resident can properly present the existing scientific and medical evidence to an Ontario court, then there is a reasonable possibility that an Ontario court would declare the *Fluoridation Act* and municipal fluoridation programs in Ontario to be unconstitutional and thus invalid. Should that occur, there is also a real possibility that the Region of Peel would be held legally liable to residents in a lawsuit for harm caused by artificial fluoridation.

This memorandum proceeds in three parts. Part I discusses the factual background to Ontario and Peel's fluoridation programs and situates these provisions in the global context. Part II discusses the scientific evidence relating to health effects of fluoridation. While fluoridation has significant potential effects on the environment and non-human animal and plant species, I focus on the human health effects because those effects are likely to figure most prominently in a legal challenge to fluoridation. Part III discusses the potential arguments in a legal challenge to fluoridation programs in Ontario as well as other legal issues that may arise in a court challenge to fluoridation in Ontario. I have also appended to this memo an affidavit from Dr. Kathleen Thiessen, a biomedical scientist, who has served on two U.S. National Research Council subcommittees dealing with fluoride exposure and toxicology. Her affidavit was commissioned specifically in connection with the ongoing debate about fluoridation in the Region of Peel.

PART I – FACTUAL BACKGROUND OF ARTIFICIAL FLUORIDATION

Fluoride is the anionic or reduced form of fluorine and is the thirteenth most abundant element in the Earth's crust. Given that fluorine is so abundant, it is not surprising that fluoride compounds are components of minerals in rocks and soil. Due to these components, and the action of ground water acting upon them, fluoride is released into the groundwater and is the major contributor to the small amounts of fluoride present in most water sources. In general, most ground water contains low concentrations of fluoride, typically less than 0.5 mg/L.

Fluoridation is the controlled addition of fluoride ions to water that has a low fluoride concentration (sometimes called “artificial fluoridation”). In the early 1900s, significant work was done in understanding the root cause of the mottling of teeth and tooth decay. This mottling, and improved dental health, was ultimately attributed to the high fluoride concentrations in the ground water that was ingested by these individuals. Over time, additional studies were undertaken, which were purported to establish a relationship between fluoride and substantially fewer cavities, ultimately leading to four community-wide trials that were established in the mid-1940s. These trials were conducted in Grand Rapids, MI; Newburgh, NY; Brantford, ON and Evanston, Ill. Soon thereafter, the U.S. Public Health Service and many dental associations endorsed community-wide fluoridation as a practical and safe public health measure to prevent tooth decay.

Over the past 65 years, additional investigation has examined everything from the health effects of the various fluoride compounds used in the fluoridation process to the dosage levels that provide adequate dental health protection. Over this time-frame, fluoride dosage levels have on average dropped from 1.0 to 1.2 mg/L to between 0.5 and 0.8 mg/L, while the maximum acceptable concentration (MAC) has been established at 1.5 ppm. The Ontario Ministry of Health and Long Term Care, in partnership with the Ontario Ministry of the Environment, have established a guideline of 0.5-0.8 mg/L for fluoride in drinking water. The Region of Peel claims to “closely monitor” the fluoride levels in the

water supply to make sure the correct concentration is being maintained.¹ Under the *Safe Drinking Water Act Regulations*, the maximum allowable concentration of fluoride in Ontario drinking water is 1.5 mg/L.²

In 1961, the Province of Ontario enacted the *Fluoridation Act*,³ which specifically provided for the establishment and maintenance of fluoridation of drinking water within the Ontario waterworks system. The *Fluoridation Act* does not require fluoridation. Under the *Act*, municipalities were given the discretionary authority, by way of the passing of a by-law “...to establish, maintain and operate, or require that the local board establish, maintain and operate, a fluoridation system in connection with the waterworks system.”⁴

Cities that already had a fluoridation program in place were not required to pass a new by-law; the *Fluoridation Act* permitted the continuation of those programs.⁵ Accordingly, the *Fluoridation Act* permitted the continuing fluoridation of the water supplies of the City of Mississauga and City of Brampton. In 2007, the Regional Municipality of Peel passed a by-law establishing a fluoridation system in the Town of Caledon.⁶

According to the Canadian Dental Association, approximately 45% of Canadians drink fluoridated public water.⁷ However, the figures vary significantly across the country. Quebec has historically opposed artificial fluoridation, and as such, today less than 3%

¹ Region of Peel, Peel Public Health, “Fluoridation - Frequently Asked Questions”, online: <http://www.peelregion.ca/health/topics/commdisease/dental/fluoridation.htm#10>.

² *Safe Drinking Water Act, 2002, Ontario Drinking Water Quality Standards*, O.R. 169/03, Schedule 2.

³ *Fluoridation Act*, R.S.O. 1990, c. F.22.

⁴ *Ibid.*, s. 2(1).

⁵ *Ibid.*, s. 2.1(2).

⁶ Regional Municipality of Peel, *A by-law to provide for the fluoridation of the Town of Caledon's communal water supply*, online: <http://www.peelregion.ca/health/topics/commdisease/dental/by-law.htm>.

⁷ Danielle Rabby-Waytowich, “Water Fluoridation in Canada: Past and Present” (July/August 2009), 75 JCDA 451, online: <http://cda-adc.ca/jcda/vol-75/issue-6/451.pdf>.

Quebec’s population drinks fluoridated water.⁸ Only approximately 3.7% of residents of British Columbia drinks fluoridated water.⁹ At 75.9%, Ontario is the most heavily fluoridated province. In recent years, however, some medium-sized municipalities, including Waterloo and Windsor, have ended their fluoridation programs.¹⁰ The debate between pro- and anti-fluoride activists in Ontario municipalities is acrimonious, with both sides accusing the other of “cherry picking” research to boost its argument. Health Canada as well as the Canadian Medical Association and the Canadian Dental Association are staunchly pro-fluoride. The Green Party of Canada, and respected NGOs such as the Council of Canadians, Green Peace Canada and Sierra Club, oppose fluoridation of municipal water supplies.

Canada’s rate of fluoridation puts it squarely in the global middle among the Organization of Economic and Cooperative Development (“OECD”) countries. According to a 2002 study, approximately 69% of U.S. residents were living in communities with fluoridated water.¹¹ By contrast, only approximately 3% of the population in Western Europe currently consumes fluoridated water.¹² Despite this fact, the available evidence does not suggest that tooth decay rates are higher in unfluoridated Western European countries than in the United States or other fluoridated countries.

PART II – SCIENTIFIC EVIDENCE CONCERNING FLUORIDATION

The success of any legal challenge to Ontario’s fluoridation program will turn on the quality of expert and scientific evidence presented. For the claimants to be successful, they will have to adduce evidence of both (1) fluoride’s speculative and/or nominal

⁸ Eric Tchouaket et al, “The economic value of Quebec’s water fluoridation program” (June 2013), 21 J Public Health 523 at 524.

⁹ *Ibid.* Danielle Rabby-Waytowich, “Water Fluoridation in Canada: Past and Present”, *supra* at 452.

¹⁰ See CBC News, “Fluoride no longer to be added to Windsor water” (Jan. 29, 2013), CBC.ca online: <http://www.cbc.ca/news/canada/windsor/fluoride-no-longer-to-be-added-to-windsor-water-1.1325977>.

¹¹ Centers for Disease Control and Prevention, “Fluoridation Status: Percentage of U.S. Population on Public Water Supply Systems Receiving Fluoridated Water”, CDC.gov online: <http://apps.nccd.cdc.gov/nohss/FluoridationV.asp>.

¹² Fluoride Action Network, “Water Fluoridation Status in Western Europe”, online: http://fluoridealert.org/content/water_europe/.

benefit in reducing dental caries; and (2) the risk of harm posed by fluoride in adults and children. To date, the most comprehensive review of the existing scientific evidence on fluoride's toxicity is the study conducted by the National Research Council's Committee on Fluoride in Drinking Water, which was published in 2006.¹³ The National Research Council ("NRC") is a non-profit entity in the United States, whose membership includes eminent scientists across the United States. It is funded in part by Congress and the U.S. federal agencies. Its studies are generally considered authoritative.

The review of the evidence below is not meant to be exhaustive. It is meant rather to highlight the types of evidence that could be presented in a legal challenge.

Lack of Evidence of Fluoridation's Benefits

The purpose of fluoridation is to reduce dental caries (tooth decay). Since the 1950s, it has been virtually gospel within the dental community that fluoridation of drinking water is responsible for reducing tooth decay. This belief was once thought to be unassailable. But the evidence available today makes it far from clear. We now know that tooth decay is enhanced or diminished by numerous factors, including dietary, socio-economic, environmental, hygienic and many other factors. Recent studies have shown that tooth decay rates have decreased as fast in unfluoridated areas as in fluoridated areas,¹⁴ leading many to suggest that other factors — i.e., improved diet, modern dental care, more regular trips to the dentist and the availability of fluoridated toothpaste — are the causes of decreases in tooth decay rather than water fluoridation.

In 1999, the U.S. Centers for Disease Control and Prevention conceded what many dental researchers already had concluded: that fluoride's predominant mechanism of action was

¹³ Committee on Fluoride in Drinking Water, National Research Council, *Fluoride in Drinking Water: A Scientific Review of EPA's Standards* (National Academies of Sciences Press, 2006) at 4 [hereinafter "NRC Report"].

¹⁴ See, e.g., John Colquhoun, *Child Dental Health Differences in New Zealand*, 9 Comm. Health Stud. 85 (1987); John Yiamouyiannis, *Water Fluoridation and Tooth Decay: Results from the 1987-1987 National Survey of Schoolchildren*, 23 Fluoride 55 (1990).

topical, not *systemic*.¹⁵ In other words, to the extent that fluoride works, it does so via direct exposure to the tooth and not from inside the body. Connett, Beck and Micklem argue persuasively that if the primary benefit of fluoride is through topical treatment on teeth, then it makes no sense to expose every tissue in the body to fluoride through ingestion in drinking water.¹⁶

Scientific Evidence of Fluoride’s Harm

There is significant scientific evidence of harm caused by fluoridation. And even if the harms associated with fluoridation cannot be proven to a degree of scientific certainty, the existing scientific information and literature point to a variety of serious risks inherent in artificial fluoridation.

Dental Fluorosis

There is a scientific consensus that fluoridation can cause “dental fluorosis”, which is a dose-related mottling of the enamel of the teeth that can range from mild discoloration of the tooth surface to severe staining and pitting. The condition is permanent after it develops in children during tooth formation. Whether to consider fluorosis to be an adverse health effect or merely a cosmetic effect has been the subject of debate. However, the U.S. National Research Council has concluded that severe fluorosis is more than a cosmetic issue because severe fluorosis can lead to enamel loss, leaving the dentin open to decay and infection and causing structural damage to the tooth.¹⁷

Muskoskeletal Effects

Skeletal fluorosis is a bone and joint condition associated with prolonged exposure to high concentrations of fluoride. Fluoride increases bone density and appears to exacerbate the growth of osteophytes present in the bone and joints, resulting in joint

¹⁵ Centers for Disease Control and Prevention, “Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries” (Oct. 1999), 48 *Mortality and Morbidity Weekly Review* 933-40, online: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4841a1.htm>.

¹⁶ Paul Connett et al, *The Case Against Fluoride: How Hazardous Waste Ended Up in Our Drinking Water and the Bad Science and Powerful Politics that Keep It There*, at 13.

¹⁷ NRC Report, *supra*, at 4

stiffness and pain.¹⁸ There is no doubt that high concentrations of fluoride cause skeletal fluorosis. The debate within the scientific community is the extent of the risk of skeletal fluorosis at current levels of fluoridation.¹⁹ Defenders of fluoridation argue that a concentration of 1.5mg/L is too low to present a risk of skeletal fluorosis. It should, however, be noted that the first symptoms of skeletal fluorosis are similar to the first symptoms of many forms of arthritis — stiffness and pain in the joints and pain in the bones.

There is also scientific evidence that fluoride can increase the risk of bone fractures. The NRC Report notes that “several strong observational studies indicated an increased risk of bone fracture in populations exposed to fluoride at 4 mg/L.”²⁰ While there are fewer studies dealing with the risk of bone fracture within populations exposed to fluoride at a rate of 2 mg/L or lower, there is a peer-reviewed study from Finland that suggests an increased rate of hip fracture in populations exposed to fluoride at concentrations above 1.5 mg/L,²¹ which is the maximum allowable rate of fluoridation in Ontario.

Neurobehavioural Effects

Animal and human studies of fluoride have been published reporting adverse cognitive and behavioural effects. Epidemiological studies conducted in China have reported I.Q. deficits in children exposed to fluoride at 2.5 to 4 mg/L in drinking water. The NRC found these studies to be sufficiently alarming to call for “additional research on the effects of fluoride on intelligence.”²² In 2012, a group of scientists published a systematic review of the literature on developmental fluoride neurotoxicity. The review concluded that the consistency of pre-existing studies showing a link between fluoride

¹⁸ NRC Report, *supra*, at 5.

¹⁹ *Ibid.* at 6.

²⁰ *Ibid.*

²¹ *Ibid.* at 7.

²² *Ibid.* at 8.

and cognitive deficits shows that potential developmental neurotoxicity of fluoride should be a high research priority.²³

The NRC also noted that fluorides “increase the production of free radicals in the brain through several different biological pathways. These changes have a bearing on the possibility that fluorides act to increase the risk of developing Alzheimer’s disease.”²⁴ The NRC has called for additional studies in this area as well.²⁵

Genotoxicity and Carcinogenicity

There have been a number of studies that have suggested a link between fluoride and bone cancer. The NRC Report concludes that fluoride “appears to have the potential to initiate and promote cancers, particularly of the bone, but the evidence to date is tentative and mixed”.²⁶ The NRC cautions readers that at the time of the publication of the NRC Report a major hospital-based study on osteosarcoma (bone cancer) and fluoride exposure was underway at the Harvard School of Dental Medicine.²⁷ The Harvard study, which was published in 2006, found an association between fluoride exposure in drinking water during childhood and the incidence of osteosarcoma among males (but not females).²⁸ This is a significant and concerning finding.

PART III – LEGAL ISSUES AND ARGUMENT

Detractors of fluoridation raise a number of policy and moral arguments. These include, *inter alia*, arguments that fluoridation may be harmful to the environment and plant and animal wildlife. They also point out that fluoridated water in much of North America is treated by using hexafluorosilicic acid (H₂SiF₆) and sodium silicofluoride (Na₂SiF₆), which are by-products of fertilizer manufacturing and which contain numerous

²³ Anna Choi et al, “Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis” (2012), 120 Environmental Health Perspectives 1362 at 1367.

²⁴ *Ibid.* at 222.

²⁵ *Ibid.*

²⁶ *Ibid.* at 336.

²⁷ *Ibid.* at 10.

²⁸ Elise B. Bassin et al, “Age-specific fluoride exposure in drinking water and osteosarcoma” (2006), 17 Cancer Causes & Control 421.

contaminants, including heavy metals such as lead and chromium, nonmetals such as arsenic, and even trace amounts of radioactive isotopes.

While these and other arguments may be persuasive policy arguments against fluoridation, a legal challenge to fluoridation based on human health effects is the most likely argument to succeed in Canadian courts. More specifically, if the proper evidence, such as the medical evidence described above, can be presented in court, there is a reasonable possibility that an Ontario court will declare the *Fluoridation Act* and the municipal fluoridation programs in Ontario to be unconstitutional.

The Constitutional Argument

The most viable legal argument against Ontario's fluoridation program is that it is unconstitutional because it violates s. 7 of the *Canadian Charter and Rights and Freedoms*. Section 7 provides that "Everyone has 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."²⁹ Legislation that conflicts with this constitutional right must be struck down.

Section 7 of the *Charter* means that everyone has the right to life, liberty and security of the person. This right, however, is not limitless. The State can limit one's rights to life, liberty and security of the person, but only if it does so in accordance with "the principles of fundamental justice." Thus, to establish a violation of s. 7 of the *Charter*, the claimant must establish: (1) that the law or State action has deprived the claimant of her or his right to life, liberty or security of the person; *and* (2) that the deprivation is inconsistent with principles of fundamental justice. There are strong arguments that a claimant challenging Ontario's *Fluoridation Act* could satisfy both of these legal requirements.

²⁹ Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (U.K.), 1982, c. 11, s. 7 [hereinafter "Charter"]. For an overview of s. 7 and its jurisprudence, see Hamish Stewart, *Fundamental Justice: Section 7 of the Canadian Charter of Rights and Freedoms* (Toronto: Irwin Law, 2012); Nader R. Hasan, "Three Theories of 'Principles of Fundamental Justice'" (2013), 63 S.C.L.R. (2d) 339.

Fluoridation Deprives Residents of the Right to Liberty and Security of the Person

The Supreme Court of Canada has found that the liberty interest protected by s. 7 includes the right to make fundamental personal choices free from state interference.³⁰ In the context of medical treatment, the Ontario Court of Appeal has held that the right not to be subject to medical treatment without informed consent is an aspect of the security of the person interest under s. 7.³¹ Section 7 thus protects “the right to be free from unwanted medical treatment.”³² To deprive individuals of the ability to make decisions with respect to their treatment and to force them to submit to medication against their competent wishes infringes the *Charter* right to security of the person as protected under s. 7 of the *Charter*.³³

Ontario’s fluoridation programs infringe upon the s. 7 right to security of the person. Fluoridation is State-imposed mass medication. This proposition was established by the Supreme Court’s 1957 decision in *Toronto (Metro) v. Forest Hill (Village)*.³⁴ In that case, the residents challenged a municipal by-law that authorized the City “to undertake the treatment of the water supply by fluoridation.” At that time, the Province’s enabling legislation only permitted the municipalities to ensure a “continued and abundant supply of pure and wholesome water.” It did not specifically authorize fluoridation or other forms of mass medication. The City argued that the power to make the water supply “pure and wholesome” implicitly authorized fluoridation. A majority of the Supreme Court of Canada disagreed. It held that fluoridation “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.” In other words, the purpose of fluoridation was not to purify the water, but to medicate the population with fluoride.

The Ontario Legislature superseded *Toronto (Metro) v. Forest Hill (Village)* when it passed the *Fluoridation Act* in 1961. But the Supreme Court of Canada’s conclusion that

³⁰ *Blencoe v. British Columbia (Human Rights Commission)*, [2000] 2 S.C.R. 307 at para. 54.

³¹ *Fleming v. Reid*, [1991] O.J. No. 1083 at para. 31, 39-40 (C.A.).

³² *Ibid.* at para. 31.

³³ *Ibid.* at para. 40.

³⁴ *Toronto (Metro) v. Forest Hill (Village)*, [1957] S.C.R. 569.

the purpose of fluoridation is not water purification but rather medication remains the finding of this country's highest court. As such, Ontario's fluoridation programs constitute medication without consent and thus deprives Ontario residents of their s. 7 liberty and security-of-the-person interests.

Fluoridation Violates the Principle of Gross Disproportionality

Given that the *Fluoridation Act* triggers the s. 7 liberty and security-of-the-person rights, the primary challenge for claimants will be in showing that the deprivation is inconsistent with the principles of fundamental justice. If that can be shown, then the claimant will have succeeded in proving that the fluoridation program is unconstitutional. The most relevant principle of fundamental justice here is the principle against *gross disproportionality*.

A law is “grossly disproportionate” if the state action or legislative response to a problem is so extreme as to be disproportionate to any legitimate government interest.³⁵ In other words, a law will be found to be grossly disproportionate where its benefits are grossly disproportionate to its potential harm.³⁶

If a claimant can properly marshal the available scientific evidence, they ought to be able to show that the *risk* of significant harm caused by fluoridation is grossly disproportionate to the speculative benefit of reduced dental carries. As noted above, recent studies suggest that the claimed reduction in tooth decay over the past several decades is more likely attributable to improved dental care rather than fluoridated water. If true, then the benefits of fluoridated water are, at best, marginal, or, at worst, non-existent.

By contrast, the negative effects of fluoridation appear to be real and substantial. As noted above, the authoritative NRC Report concludes that dental fluorosis is more than

³⁵ R. v. Malmo-Levine, [2003] 3 S.C.R. 571 at para. 143.

³⁶ *Canada (Attorney General) v. PHS Community Services Society*, [2011] S.C.J. No. 44, [2011] 3 S.C.R. 134 at para. 153; *Canada (Attorney General) v. Bedford*, 2013 SCC 72 at para. 159.

just a cosmetic effect.³⁷ Peer-reviewed scientific studies show that water fluoridation can have an adverse impact on children's I.Q..³⁸ Other studies show that fluoride can affect bone and make fractures more likely.³⁹ The 2006 Harvard study shows an association between osteosarcoma and fluoridated water.⁴⁰ Even if these negative effects are not conclusively proven, the *risk* of potential harm is significant. It would be reckless to expose residents to the risk of cancer, among other things, for the marginal benefit of reduced tooth decay, particularly where, as here, it is no longer clear that fluoridated drinking water is even a significant contributor to reduced tooth decay. Marginal benefit in exchange for significant risk is the *sine qua non* of gross disproportionality.

The likelihood of success of a hypothetical legal challenge to fluoridation will turn largely on the strength of the scientific evidence presented in court because the stronger the scientific evidence of risk of harm, the greater the gross disproportionality.

Previous Legal Challenges Are Not Indicative of Likelihood of Success in Ontario

Skeptics about the viability of a successful legal challenge to Ontario's fluoridation program will point out that since the Supreme Court's 1957 decision *Toronto (Metro) v. Forest Hill (Village)*, which was superseded by legislative action (see *supra* at 10-11), all other legal challenges to fluoridation programs in North America have failed. For the following reasons, I do not regard these cases as barring a legal challenge in Ontario.

The Canadian Cases

In Canada, there have been unsuccessful challenges to fluoridation programs in Alberta and British Columbia: see, e.g., *Millership v. Kamloops (City)*;⁴¹ *Locke v. Calgary (City)*.⁴² Those cases, however, are distinguishable on at least three different grounds.

³⁷ *Supra* at 6.

³⁸ *Supra* at 7.

³⁹ *Supra* at 6-7.

⁴⁰ *Supra* at 7-8.

⁴¹ [2003] B.C.J. No. 109 (B.C. Sup. Crt).

⁴² [1993] A.J. No. 926 (Q.B.).

First, those challenges were brought by self-represented litigants. While it appears that these individuals did an admirable job at marshaling the evidence and the arguments, novel constitutional challenges such as this are highly complex and require the assistance of counsel.

Second, the scientific evidence about fluoridation is improving. More information than ever before is known about fluoridation. At the time that *Millership* (2003) and *Locke* (1996) were decided, for example, the NRC Report had not yet been published. Nor had the Harvard study on the association between osteosarcoma and artificial fluoridation been completed.

Third, Canadian constitutional law under s. 7 of the *Charter* has developed significantly over the past five years. The principle of fundamental justice of “gross disproportionality” is a fairly new principle in Canadian constitutional law. Prior to the Supreme Court’s recent decisions in *PHS* and *Bedford*, there was some doubt over whether this principle was indeed a principle of fundamental justice and also some doubt over what “gross disproportionality” actually meant. In my view, the best argument against fluoridation relies on the principle of gross disproportionality. This argument was not available to the claimants in *Locke* and *Millership*. Each of these factors suggests that these other cases will not bar a successful constitutional challenge to fluoridation in Ontario.

The U.S. Cases

The U.S. cases are also distinguishable, but for different reasons. There have been a handful of high-profile cases in the United States that involved challenges to municipal fluoridation programs. These challenges have failed on technical grounds, but each time the trial judge made judicial findings of fact that supported the plaintiffs’ arguments that fluoridation causes harm to humans. In *Aitkended v. Borough of West View*, the trial judge granted a preliminary hearing enjoining the municipality from continuing its fluoridation program on the basis that the plaintiffs had shown compelling evidence that fluoride may be a carcinogen.⁴³ That decision was superseded by legislative action,⁴⁴ but

⁴³ *Aitkended v. Borough of West View*, No. GD-458578 (Allegheny County Court of Common Pleas, Pa); see also John Remington Graham and Pierre-Jean Morin, “Highlights in North American Litigation During

the factual findings spurred investigations into fluoridation in the United Kingdom and in Quebec, with the latter ultimately imposing a moratorium on fluoridation across the Province.⁴⁵

The next important U.S. case involving a challenge to fluoridation was *Illinois Pure Water Committee v. Director of Public Health*.⁴⁶ After a lengthy trial, Judge Niemann concluded that fluoridation legislation, which “exposes the public to the risk, uncertain in its scope, of unhealthy side effects of artificial fluoridation in water supplies, is unreasonable, and [is] a violation of the due process clause of the Illinois Constitution of 1970.”⁴⁷ He further noted that “[t]his 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 a safe and effective means of promoting public health.”⁴⁸ Accordingly, Judge Niemann entered a permanent injunction enjoining further fluoridation in Illinois. The Illinois Supreme Court granted the State’s appeal, but it did not disturb any of Judge Niemann’s factual findings.⁴⁹ Instead, the Illinois Supreme Court relied on an expansive doctrine of “police powers”, under which the State was granted significant deference on decisions relating to public health. The Illinois Supreme Court wrote that the “wisdom, necessity and expediency” of the fluoridation program “are no concern of the courts, but are matters primarily for the legislative body of the municipality, and courts are without power to interfere merely because they believe a different regulation might have been wiser or better.”⁵⁰ Under this heightened evidentiary burden, it was not enough that the

the Twentieth Century on Artificial Fluoridation of Public Water Supplies,” 14:2 J. Land Use & Envtl. L. 195 at 229-232.

⁴⁴ *Aitkendale v. Borough of West View*, 397 A.2d 878 (Pa. Commw. Ct. 1979)

⁴⁵ See Graham and Morin, “Highlights in North American Litigation During the Twentieth Century on Artificial Fluoridation of Public Water Supplies,” *supra* at 232.

⁴⁶ *Illinois Pure Water Committee v. Director of Public Health*, No. 68-E-128 (Madison County Circuit Court Ill. 1982).

⁴⁷ *Ibid.* at 32.

⁴⁸ *Ibid.* at 33.

⁴⁹ *Illinois Pure Water Committee v. Director of Public Health*, 470 N.E.2d 988 (Ill. Sup. Ct. 1984).

⁵⁰ *Ibid.* at 991-992.

plaintiffs have shown that fluoridation causes “some risk of a higher incidence of cancer.”⁵¹

The court reached a similar result in *Safe Water Foundation of Texas v. City of Houston*, a challenge to the City of Houston’s fluoridation program. After a lengthy trial, with ample expert testimony on both sides, the trial judge concluded that artificial fluoridation of public water supplies “may cause or contribute to cancer, genetic damage, intolerant reactions and chronic toxicity, including dental mottling...,” and “that the value of said artificial fluoridation is in some doubt as to the reduction of tooth decay in man.”⁵² Still, the court denied the plaintiffs’ motion for an injunction on grounds of police powers. The Texas Court of Appeals denied the appeal on similar grounds, but also acknowledged the significant evidence in the record that fluoridation caused harm. It noted that if the standard had been the normal civil standard of evidence (e.g., a balance of probabilities), the plaintiffs would have won. Indeed, the Texas Court of Appeals expressly found that a fair preponderance of evidence showed that “the injection of fluoride into the City’s water system would be harmful,” but saved the legislation on police power grounds.⁵³

The U.S. cases would likely have reached a different result had Canadian law been applied or if those cases had been litigated in Canadian courts. The U.S. cases applied a very deferential standard to the pro-fluoridation defendants and held the plaintiffs to a nearly impossible burden of proof. A claimant bringing a constitutional challenge under s. 7 of the Charter would not face the same obstacles. In other words, the police powers doctrine would not save the Ontario *Fluoridation Act* if fluoridation was found to cause harm.

The Use Hexafluorosilicic Acid (H₂SiF₆)

I have been advised that the Region of Peel uses hexafluorosilicic acid to fluoridate its drinking water. Hexafluorosilicic acid is a waste product that is created in the fertilizer

⁵¹ *Ibid.* at 992.

⁵² *Safe Water Foundation of Texas v. City of Houston*, No. 80-52271, Findings of Fact, May 24, 1982, at 1-2.

⁵³ *Safe Water Foundation of Texas v. City of Houston*, 661 S.W.2d 190 at 192 (Tex. App. 1983).

manufacturing process.⁵⁴ When hexafluorosilicic acid is in its gaseous form (hydrogen fluoride (HF) and silicon tetrafluoride (SiF₄)), it is a highly toxic substance.

Proponents of using hexafluorosilicic acid as a fluoridating agent argue that by the time it is diluted by about 180,000 to 1 (to reach acceptable fluoride concentrations), the contaminant levels will be below regulatory concern.⁵⁵ But this argument overlooks the fact that amounts of other contaminants, such as arsenic, remain in the hexafluorosilicic acid solution. The U.S. Environmental Protection Agency sets the ideal safety goal for arsenic in drinking water at zero because arsenic is a known human carcinogen.⁵⁶ While there may be trace amounts of arsenic naturally occurring in water, it is difficult to justify the *addition* of a known carcinogen.⁵⁷ Critics of hexafluorosilicic acid also point out that there are no known toxicological studies regarding the safety of using hexafluorosilicic acid to fluoridate water.

Apart from the constitutional argument described above, the use of hexafluorosilicic acid may violate the *Safe Drinking Water Act*. Section 20 of the *Safe Drinking Water Act* provides that “[n]o person shall cause or permit any thing to enter a drinking water system if it could result in ... a drinking water health hazard...” or “is a contravention of a prescribed standard.”⁵⁸

The use of hexafluorosilicic acid may also violate the federal *Food and Drugs Act*. Section 4 of the *Food and Drugs Act* prohibits the sale of articles of food or drink that “has in or on it any poisonous or harmful substance.”⁵⁹ To the extent that hexafluorosilicic acid contains a known carcinogen, then its addition to the water

⁵⁴ Paul Connett et al, *The Case Against Fluoride*, *supra* at 16.

⁵⁵ *Ibid.* at 19.

⁵⁶ United States Environmental Protection Agency, “Arsenic in Drinking Water”, online: <http://water.epa.gov/lawsregs/rulesregs/sdwa/arsenic/index.cfm>.

⁵⁷ *Ibid.*

⁵⁸ *Safe Drinking Water Act*, 2002, S.O. 2002, ch. 32, s. 20(1)(a).

⁵⁹ *Food and Drugs Act*, R.S.C., 1985, c. F-27, s. 4.

represents the addition of a “poisonous or harmful substance”, which is, in turn, sold to the residents of Peel.

Liability of the Region of Peel

A finding that the Region of Peel’s fluoridation program is unconstitutional and/or that the use of hexafluorosilicic acid is illegal could have significant pecuniary implications for the Region. If a court should find that the fluoridation program was unconstitutional because of an unacceptable risk of harm, this could pave the way for lawsuits against the municipality.

The *Municipal Act, 2001* imposes a statutory duty of care on those who oversee drinking water systems and makes municipalities liable in tort for acts or omissions.⁶⁰ Moreover, as of December 31, 2012, amendments to the *Safe Drinking Water Act* clarified the standard of care for municipalities. Under this standard, municipalities must 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.⁶¹ The standard of care also extends to the owner of the municipal drinking water system, and to those people who, on behalf of the municipality, oversee the accredited operating authority or who exercise decision-making authority over the system.

The *Safe Drinking Water Act* puts responsibility for ensuring safe drinking water squarely on the municipalities. It also arguably makes those who make decisions about the municipal water supplies — such as Councillors — personally liable for acts or omissions.⁶² It follows that if a court should find that fluoridation puts residents of Peel at risk of harm, then the Region of Peel and its Councillors may be liable to its residents for damages on the civil negligence standard.

⁶⁰ *Municipal Act, 2001*, S.O. 2001, ch. 25, ss. 448(2), 448(3).

⁶¹ *Ibid.*, s. 19(1).

⁶² *Ibid.*, s. 19(2).

It is also worth noting that the Region faces potential liability not only under a potential civil suit brought by residents but may also be prosecuted by the Province. Under the *Safe Drinking Water Act Regulations*, any person resident in Ontario can ask the Ontario government to investigate the Region for an alleged violation of the *Act*.⁶³ Furthermore, the *Safe Drinking Water Act* provides that a violation of s. 20 — the prohibition on putting material into water that could cause a health hazard — shall be a criminal offence. Thus, if fluoride is proven to cause harm or a risk of harm, then a municipality that continues to fluoridate could theoretically face *criminal* prosecution.

Thus, a municipality that fails to discharge its duty of care under the *Safe Drinking Water Act* could face (1) civil liability to residents in a civil lawsuit; (2) prosecution by the Ontario government; and (3) potentially, criminal liability. These risks and liabilities ought to be sufficient to encourage municipalities to carefully re-examine their water fluoridation programs.

CONCLUSION AND RECOMMENDATIONS

In sum, if a resident of Peel succeeds in marshaling the available scientific evidence in court, there is a reasonable possibility that the *Fluoridation Act* and the Peel fluoridation programs could be found to be unconstitutional under s. 7 of the *Charter*. And if it is demonstrated in court that fluoridation puts the residents of Peel at risk, the Region is potentially liable in tort to every resident of the Region who drinks fluoridated municipal water.

It is recommended that the Regional Council take the following steps:

1. That the Council pass a resolution to re-examine its fluoridation program;
2. That the Council hear expert testimony from experts in the fields of medicine, epidemiology and dentistry to better understand the risks and benefits associated with water fluoridation;

⁶³ *Safe Drinking Water Act, 2002, Compliance and Enforcement Regulation*, O. Reg. 242/05, s. 7(1).

3. That the Council hear expert testimony both from experts who support fluoridation and those who oppose fluoridation; and
4. That the Council require that experts presenting their opinions also provide the Council with the underlying data and studies on which they are relying for their opinions. There is enough competing opinion in the scientific community that it will be important for municipalities to understand the bases for scientific opinion as they re-examine this important issue.

I look forward to discussing the foregoing with you further.

Nader R. Hasan

Affidavit of Kathleen M. Thiessen, Ph.D.

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April 29, 2014

I, KATHLEEN THIESSEN, of the City of Oak Ridge, in the State of Tennessee, HEREBY MAKE OATH AND SAY AS FOLLOWS:

I have been asked to prepare an affidavit concerning the health effects associated with water fluoridation in connection with the Region of Peel's reconsideration of its water fluoridation policies. I make this affidavit for no improper purpose.

Background and experience on the fluoridation issue

I hold a Ph.D. degree in Biomedical Sciences (concentration, genetics) from the University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences and a B.A. degree in Biology and Chemistry from Covenant College. While a member of the Chemical Hazard Evaluation Program of the Health and Safety Research Division of Oak Ridge National Laboratory, I authored a *Summary Review of Health Effects Associated with Hydrogen Fluoride and Related Compounds: Health Issue Assessment* for the Environmental Protection Agency, as well as health effects assessments for other chemicals. I have served on two National Research Council subcommittees, one dealing with fluoride exposure and toxicology (*Fluoride in Drinking Water: A Scientific Review of EPA's Standards*) and one dealing with guidance levels for air contaminants, including hydrogen fluoride (*Emergency and Continuous Exposure Guidance Levels for Selected Submarine Contaminants: Volume 3*). I am currently a Senior Scientist with Oak Ridge Center for Risk Analysis, Inc., where my projects have involved a variety of assessments of contaminant transport, human exposures, toxicity, and health risks for both radiological and chemical contaminants.

I have given presentations on fluoride exposure, toxicology, and health risks to a variety of audiences, including technical (International Society for Fluoride Research, American Scientific Affiliation, International Academy of Oral Medicine and Toxicology), academic (Binghamton University, Covenant College), and lay (Metropolitan Water District of Southern California; 2nd Citizens' Conference on Fluoride; the Tennessee legislature; the towns of Yellow Springs, Ohio, and Maryville, Tennessee). I have provided comments on fluoride-related technical reports to Health Canada, the Committee on Health and Social Services of Québec, the U.S. Environmental Protection Agency, the U.S. Department of Health and Human Services, the California Environmental Protection Agency, the Food and Drug Administration, and the Agency for Toxic Substances and Disease Registry. I have also provided comments to a variety of state and local authorities and responded to interview requests from various news media.

Attached hereto as Exhibit "A" to this Affidavit is a true and correct copy of my curriculum vitae.

Introduction

I first became acquainted with the scientific and medical literature on fluoride exposure and toxicology in the mid-1980s, when I prepared a health issue assessment on airborne fluoride for the Environmental Protection Agency (EPA). This assessment was published in 1988 as *Summary Review of Health Effects Associated with Hydrogen Fluoride and Related Compounds: Health Issue Assessment*, Report No. EPA/600/8-89/002F (EPA 1988), and included a review of

available scientific literature through January 1987. The EPA's main concern initially was hydrogen fluoride (HF). At my request, the scope of the report was expanded to include other fluoride-containing compounds. In many situations, intake of airborne fluoride is small in comparison to total intake of fluoride, but most of the toxicological effects depend on total intake of fluoride from all sources. I pointed out in this report that (1) health effects from chronic fluoride exposure are dependent on total fluoride intake from all sources; (2) people with kidney disease (renal dysfunction) are at higher risk for toxic effects due to slower clearance of fluoride from the body; (3) at least some of the decline in tooth decay attributed to fluoridated water may be due to other causes (e.g., changes in dietary patterns, changes in immune status, use of topical fluorides); and (4) the beneficial effects and adverse effects of fluoride must be weighed in determining the optimal dose for humans, and in particular, the optimal fluoride level to be maintained in public water supplies.

In 1998, I reviewed some materials on fluoridation sent to the county school board on which my father served (Lee County, Florida) by one of the science teachers in the school system. At this time I began to be more aware of information calling into question the wisdom of water fluoridation. Some of this information was new since I had reviewed fluoride toxicity in the 1980s, and some of it was material that I had not found or had not fully appreciated in the 1980s. In particular, I learned that (1) few if any studies had examined the chemicals actually used in water fluoridation or the fluoridated tap water as it is consumed; (2) many human studies considered only the fluoride level in the local water supply, rather than the actual fluoride intakes experienced by individuals; (3) there was evidence for an association between water fluoridation and increased lead levels in tap water and in children's blood; (4) other countries were moving

away from fluoridation of drinking water; and (5) people's fluoride intake was likely higher than had been assumed, especially for people with high water intake (e.g., athletes, outdoor workers, diabetics). I found the association between fluoridation and lead exposure especially troubling, as the connection between lead exposure and subsequent neurological and behavioral problems in children was becoming established. It also was becoming apparent to me that an association between fluoride exposure and a number of previously unacknowledged adverse health effects was plausible, but inadequately studied.

In 2003, I was asked to serve on a National Research Council (NRC) subcommittee charged with reviewing fluoride exposure and toxicology, and specifically with evaluating whether the EPA's drinking water standard was sufficiently protective. As described in our 2006 report (*Fluoride in Drinking Water: A Scientific Review of EPA's Standards*; NRC 2006), the committee unanimously concluded that the EPA's maximum contaminant level goal (MCLG, a nonenforceable, health-based standard) was not protective, and hence its maximum contaminant level (MCL, the enforceable standard, in this case equal to the MCLG) was not protective. This conclusion was based on severe dental fluorosis, stage II skeletal fluorosis, and increased risk of bone fracture, adverse effects for which sufficient information is available in the literature to consider them to be "known" adverse health effects from fluoride exposure. EPA's MCLG is supposed to be set "at a level at which no known or anticipated adverse effect on the health of persons is expected to occur and which allows an adequate margin of safety" (EPA 2012). The NRC subcommittee also reviewed a number of other adverse health effects which can reasonably be anticipated from fluoride exposure, at the exposure levels experienced by people served with

fluoridated water. The NRC subcommittee did not review the assumed benefits of fluoride exposure or of water fluoridation, nor did it specifically evaluate the safety of water fluoridation.

In 2008 I was asked to serve on another NRC subcommittee, this one looking at guidance levels for air contaminants on submarines, for both acute and chronic exposures. One of the chemicals on the list was hydrogen fluoride (NRC 2009). For chronic toxicity of hydrogen fluoride, the total fluoride exposure from all sources has to be considered, as I had pointed out in 1988. The population of interest for this subcommittee was limited to healthy young men (submarine crews include no women, children, older men, or men with certain known health problems). This report provides a list of average exposure levels at which fluoride-related health effects have been reported and an estimate of the average exposure levels experienced by submarine crews on and off the submarines.

From working on the NRC reports (2003 on), I became well acquainted with the literature on fluoride exposure and on adverse health effects from fluoride exposure. Following publication of the NRC report in 2006, I also began reviewing material on the assumed benefits of fluoridation. I have also reviewed both recent and not-so-recent documents from the Centers for Disease Control and Prevention, the Department of Health and Human Services, the U.S. Environmental Protection Agency, the National Research Council, Health Canada, the American Dental Association (ADA), the Canadian Dental Association (CDA), and others. From my extensive review of the scientific and medical literature, agency reports, and other publicly available information, I have identified three major areas of concern:

- (1) Available data do not support a role of community water fluoridation in improving dental health.
- (2) A variety of adverse health effects are associated with fluoride exposures in the range experienced by people with fluoridated water.
- (3) By fluoridation of drinking water, governments and water suppliers are indiscriminately administering a drug to the population, without individual evaluation of need, appropriate dose, efficacy, or side effects..

The following three sections of this affidavit address these three areas of concern. The fourth section of this affidavit summarizes the typical fluoride intakes that can be expected in fluoridated communities in Ontario and compares them with estimated levels of intake associated with specified adverse health effects.

(1) Available data do not support a role of community water fluoridation in improving dental health.

Health Canada "supports water fluoridation as a public health measure to prevent dental decay" (Health Canada 2011a), and the Chief Medical Officer of Health for Ontario has "urge[d] all Ontarians to continue to support the fluoridation of their municipal drinking water systems so that everyone can enjoy the lasting health benefits" (OMHLTC 2011). The U.S. Department of Health and Human Services (HHS) considers community water fluoridation to be important in the prevention of dental caries (Federal Register 2011), and the CDC has listed it among the "ten great public health achievements of the 20th century" (CDC 1999; cited by Health Canada 2011a; OMHLTC 2011). Governments and health agencies in several other countries also

consider water fluoridation to be important and beneficial. However, the question of whether water fluoridation actually produces a benefit requires further attention.

The University of York's thorough review of human studies on effects of water fluoridation (McDonagh et al. 2000) is often cited as showing the safety and efficacy of water fluoridation, but it actually does neither (Wilson and Sheldon 2006; Cheng et al. 2007). The report mentions a surprising lack of high quality studies demonstrating benefits, and also finds little evidence that water fluoridation reduces socioeconomic disparities:

Given the level of interest surrounding the issue of public water fluoridation, it is surprising to find that little high quality research has been undertaken.
(McDonagh et al. 2000)

Water fluoridation aims to reduce social inequalities in dental health, but few relevant studies exist. The quality of research was even lower than that assessing overall effects of fluoridation. (Cheng et al. 2007)

Evidence relating to reducing inequalities in dental health was both scanty and unreliable. (Wilson and Sheldon 2006)

The apparent benefit is modest, about a 15% difference in the proportion of caries-free children (McDonagh et al. 2000). The American Dental Association (2005) states that “water fluoridation continues to be effective in reducing dental decay by 20-40%,” which would

translate to less than 1 decayed, missing, or filled permanent tooth (DMFT) in older children and adolescents (based on U.S. data from CDC 2005). Health Canada (2010a) cites the York review (McDonagh et al. 2000) and a major U.S. study by Heller et al. (1997), among others, as support for the effectiveness of water fluoridation. Heller et al. (1997), described in more detail below, is used as the basis for Health Canada's determination of an "optimal" concentration of fluoride in drinking water of 0.7 mg/L (Health Canada 2010a).

Neither McDonagh et al. (2000), the ADA (2005), nor Health Canada (2010a) mentions that fluoride exposure appears to delay the eruption of permanent teeth, although this has been known since the 1940s (Short 1944; Feltman 1956; NRC 2006; Limeback and Robinson 2012). A delay in tooth eruption alters the curve of caries rates with respect to age and complicates the analysis of age-specific caries rates (Psoter et al. 2005; Alvarez 1995; Alvarez and Navia 1989). Specifically, "the longer the length of exposure to the oral environment the greater is the risk of the tooth becoming carious" (Finn and Caldwell 1963; citing Finn 1952). Komárek et al. (2005) have calculated that the delay in tooth eruption due to fluoride intake may explain the apparent reduction in caries rates observed when comparisons are made at a given age, as is usually done.

Most studies of benefits of fluoride intake or fluoridation have failed to account for a number of important variables, including individual fluoride intakes (as opposed to fluoride concentrations in the local water supplies), sugar intake, socioeconomic variables, and the general decline in caries rates over the last several decades, independent of water fluoridation status (e.g., Diesendorf 1986; Colquhoun 1993). When World Health Organization data on oral health of children in various countries are compared, similar declines in caries over time are seen in all

developed countries, regardless of fluoridation status (Cheng et al. 2007; Neurath 2005). The only peer-reviewed paper to be published from California's major oral health survey in the 1990s reported no association between fluoridation status and risk of early childhood caries (Shiboski et al. 2003). Several studies show differences in caries rates with socioeconomic status or dietary factors but not with fluoridation status (e.g., Barnes et al. 1992; Adair et al. 1999; Hamasha et al. 2006).

In general, the role of diet and nutrition in good dental health seems to be underappreciated. For example, Cote et al. (2004) have documented a much lower rate of caries experience in refugee children from Africa than in U.S. children or refugee children from Eastern Europe, a situation that the authors attribute more to the amount of sugar in the diet than the presence of fluoride in the water. Finn (1952) provides an extensive review of dental caries in “modern primitive peoples,” concluding that they “show less dental caries than do most civilized peoples. . . . Evidence indicates, however, that primitive peoples have an increased caries attack rate when brought into contact with modern civilization and a civilized diet.”

A number of sources (reviewed by NRC 2006), including the CDC (2001), indicate that any beneficial effect of fluoride on teeth is topical (e.g., from toothpaste), not from ingestion. Featherstone (2000) describes mechanisms by which topical fluoride has an anti-caries effect and states that “[f]luoride incorporated during tooth development [i.e., from ingested fluoride] is insufficient to play a significant role in caries protection.” Also:

The fluoride incorporated developmentally—that is, systemically into the normal tooth mineral—is insufficient to have a measureable effect on acid solubility. (Featherstone 2000)

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. (CDC 2001)

Fluoride concentrations in drinking water or saliva are too low to be contributing significantly to a topical anti-caries effect, especially since most drinking water is not “swished” around the teeth before being swallowed. CDC (2001) states that “The concentration of fluoride in ductal saliva, as it is secreted from salivary glands, is low—approximately 0.016 parts per million (ppm) in areas where drinking water is fluoridated and 0.006 ppm in nonfluoridated areas. This concentration of fluoride is not likely to affect cariogenic activity.”

The single study that has examined caries experience in relation to individual fluoride intakes at various ages during childhood (the Iowa study) has found no association between fluoride intake and caries experience; caries rates (% of children with or without caries) at ages 5 and 9 were similar for all levels of fluoride intake (Warren et al. 2009). This paper, which is not mentioned by Health Canada (2010a), reports that “the benefits of fluoride are mostly topical” and that their “findings suggest that achieving a caries-free status may have relatively little to do with fluoride *intake*” (emphasis in the original). Most of the children with caries had “relatively few decayed or filled surfaces” (Warren et al. 2009). The authors' main conclusion:

Given the overlap among caries/fluorosis groups in mean fluoride intake and extreme variability in individual fluoride intakes, firmly recommending an “optimal” fluoride intake is problematic. (Warren et al. 2009).

Health Canada (2010a) bases its "optimal" concentration of fluoride in drinking water (0.7 mg/L) on a national data set collected in the U.S. in 1986-1987 (more than 16,000 children, ages 7-17, with a history of a single continuous residence), as reported by Heller et al. (1997). However, these data actually show essentially no difference in caries rates in the permanent teeth of children with different water fluoride levels (Table 1; Fig. 1; data obtained from Heller et al. 1997; similar data can be obtained from Iida and Kumar 2009). Analysis in terms of mean DMFS (decayed, missing, or filled tooth surfaces) for the group (Fig. 2), as opposed to caries prevalence, shows an apparent 18% decrease between the low-fluoride (< 0.3 mg/L) and fluoridated (0.7-1.2 mg/L) groups. In absolute terms, this is a decrease of about one-half (0.55) of one tooth surface per child. One possible explanation is delayed tooth eruption, which was not considered in the study. Note that the mean DMFS for the highest fluoride group is higher than for either of the two intermediate groups, also indicating that DMFS scores are not solely a function of water fluoride concentration. When the data are examined by the distribution of DMFS scores (Fig. 3), no real difference in caries experience with respect to water fluoride concentration is observed.

Overall, the available data, responsibly interpreted, indicate little or no beneficial effect of water fluoridation on oral health.

(2) A variety of adverse health effects are associated with fluoride exposures.

For most Canadians in fluoridated areas (45% of Canadians, 76% of Ontario residents; Health Canada 2011a), the single largest source of fluoride exposure is municipal tap water, including tap water used directly, beverages and foods prepared with municipal tap water either at home or in restaurants, and commercial beverages and processed foods prepared with municipal tap water. For a water fluoride level of 0.7 mg/L (0.7 ppm), considered the "optimal" level by Health Canada (2010a,b; 2011b), estimated average exposures to fluoride from all sources range from about 0.02 mg/kg/day (mg of fluoride per kg of body weight per day) for adults and nursing infants to 0.065 mg/kg/day for non-nursing infants (especially infants fed formula prepared with fluoridated tap water; based on NRC 2006). Note that these are estimated *average* exposures. For individuals with high tap water consumption (discussed by NRC 2006), total fluoride exposures at 0.7 mg/L can exceed 0.1 mg/kg/day for some adults and may approach 0.2 mg/kg/day for some infants. In one of the few studies to evaluate individual intake of fluoride from all sources, Warren et al. (2009) report individual fluoride intakes (from all sources) in excess of 0.2 mg/kg/day for some infants.

The NRC (2006) identified several sizeable subgroups of the U.S. population that require special consideration due to above-average fluoride exposures, increased fluoride retention, or greater susceptibility to effects from fluoride exposures; these groups can reasonably be expected to exist in Canada as well. Groups known to be at risk of high fluoride intake include those with high water intake (e.g., outdoor workers, athletes, and individuals with diabetes insipidus or

other medical conditions) or exposure to other sources of fluoride intake (NRC 2006). In addition, people with impaired renal function are at higher risk of adverse effects per unit intake of fluoride, due to impaired excretion of fluoride and consequent higher fluoride concentrations in the body. Tap water consumption varies among individuals by more than a factor of 10, depending on age, activity level, and the presence of certain health conditions such as diabetes insipidus (NRC 2006; see also Warren et al. 2009 for an example of estimated fluoride intakes for individual children at different ages). A substantial number of U.S. infants have water consumption rates in excess of 0.1 L/kg/day (100 mL per kg body weight per day; NRC 2006; EPA 2004a), and a similar situation can be expected in Canada.

Canada recently reduced its "optimal" concentration of fluoride in drinking water from a range of 0.8-1.0 mg/L to a single value of 0.7 mg/L (Health Canada 2011b). In 2011, The U.S. Department of Health and Human Services (HHS) proposed a similar new recommendation (Federal Register 2011; still not official) of a single value of 0.7 mg/L (0.7 ppm), consistent with the Canadian recommendation. Both the Canadian and U.S. recommendations address only dental fluorosis (discussed below), while ignoring a long list of other health concerns for the U.S. population. Dental fluorosis itself has been associated with increased risks of various adverse health effects, including thyroid disease, lowered IQ, and bone fracture (Alarcón-Herrera et al. 2001; Zhao et al. 1996; Li et al. 1995; Lin et al. 1991; Desai et al. 1993; Yang et al. 1994; Jooste et al. 1999; Susheela et al. 2005), although this is not addressed by either the Canadian or U.S. recommendations. To the best of my knowledge, no published studies in the U.S. or Canada have looked for associations between dental fluorosis and risk of other adverse effects.

However, the failure to look for adverse health effects does not demonstrate the absence of adverse health effects.

The NRC (2006) indicated that the Environmental Protection Agency's (EPA's) present drinking water standards for fluoride (maximum contaminant level goal [MCLG] and maximum contaminant level [MCL], both at 4 mg/L) are not protective of human health, based on preventing severe dental fluorosis, stage II skeletal fluorosis, and increased risk of bone fractures. Given the wide range of water intake within the American population and the presence of other sources of fluoride intake, one can reasonably expect that a "safe" level of fluoride in drinking water would be at least a factor of 10 below the "unsafe" level of 4 mg/L. EPA's MCLG is defined as a "non-enforceable health goal which is set at a level at which no known or anticipated adverse effect on the health of persons is expected to occur and which allows an adequate margin of safety" (EPA 2012). Dental fluorosis, skeletal fluorosis, and increased risk of bone fracture are all reasonably well known and acknowledged adverse health effects from fluoride exposure. However, EPA is also required to consider the "anticipated" adverse effects (which may occur at lower levels of fluoride exposure than the "known" effects) and allow for an adequate margin of safety.

Thus, based on the NRC's review of the EPA standards and EPA's own requirements, neither the Canadian "optimal" fluoride concentration nor the proposed U.S. recommendation for water fluoridation, both at 0.7 mg/L, can be considered adequate to protect against known or anticipated adverse effects, and neither allows an adequate margin of safety to protect young children, people with high water consumption, people with kidney disease (resulting in reduced

excretion of fluoride), and other potentially sensitive population subgroups. The Canadian Maximum Acceptable Concentration (MAC) for fluoride in drinking water, 1.5 mg/L (Health Canada 2010a), is less than a factor of 3 below the value (4 mg/L) that the NRC (2006) concluded is not safe.

According to the Canadian Dental Association (CDA 2009), an "additive" to drinking water "should not add more than 10% of the EPA-established MCL (Maximum Contaminant Level) of any regulated drinking water substance in order to ensure the protection of the public." Fluoride is a regulated drinking water substance, and ten percent of the EPA-established MCL for fluoride (4 mg/L) is 0.4 mg/L. Canada's equivalent to the MCL in the U.S. is its MAC, which for fluoride is 1.5 mg/L (Health Canada 2010a); ten percent of the MAC is 0.15 mg/L. Nevertheless, Health Canada recommends an "optimal" concentration of 0.7 mg/L, thus contradicting the guidelines used for most other regulated substances in drinking water.

In addition to the "known" adverse health effects of dental fluorosis, skeletal fluorosis, and increased risk of bone fracture, "anticipated" adverse health effects from fluoride exposure or community water fluoridation include (but are not limited to) carcinogenicity, genotoxicity, endocrine effects, increased blood lead levels, neurotoxicity, and hypersensitivity (reduced tolerance) to fluoride. These effects (described in more detail below) are not as well studied as the dental and skeletal effects, which should indicate that a greater margin of safety is necessary to ensure protection of the population—"in the face of uncertain evidence it is important to act in a manner that protects public health" (Tickner and Coffin 2006). In addition, it should be noted that some of these effects may occur at lower fluoride exposures than those typically associated

with dental or skeletal effects, such that protection against the dental or skeletal effects does not necessarily ensure protection against other anticipated adverse health effects.

A few comments regarding the interpretation of the available fluoride studies may be helpful. As Cheng et al. (2007) have described, a “negative” study may simply mean that the study was not sufficiently sensitive to demonstrate a moderate (as opposed to large) effect. This is often due to use of too small a sample size. In addition, study populations are often grouped by community, water source, or fluoride concentration in the water, rather than by individual intake. Due to the wide variation in drinking water intake, this approach results in study groups with overlapping intakes and makes it difficult to detect dose response relationships that do in fact exist.

The few studies that have looked at age-dependent exposure to fluoride have found increased risks of adverse effects (e.g., Bassin et al. 2006 for osteosarcoma; Danielson et al. 1992 for hip fracture risk); studies that have not looked at age-dependent exposure cannot be assumed to provide evidence of no effect. Similarly, studies that have used a measure of current exposure where a cumulative measure would be more appropriate, or vice versa, cannot be assumed to demonstrate lack of an effect.

Studies of fluoride toxicity in laboratory animals are sometimes dismissed as irrelevant because the exposures or fluoride concentrations used were higher than those expected for humans drinking fluoridated tap water. It is important to know that animals require much higher exposures (5-20 times higher, or more; see NRC 2006; 2009) than humans to achieve the same

effects or similar fluoride concentrations in bone or serum. In other words, humans are considerably more sensitive to fluoride than are most animal species that have been studied.

A number of adverse health effects can be expected to occur in at least some individuals when estimated average intakes of fluoride are around 0.05 mg/kg/day or higher (NRC 2006; 2009). For persons with iodine deficiency, average intakes as low as 0.01-0.03 mg/kg/day could produce effects (NRC 2006). The next few sections briefly summarize some (not all) of the adverse health effects, known and anticipated, that have been documented for fluoride exposure. Most of these effects have been reviewed in detail by the NRC (2006), although the NRC did not specifically evaluate health risks over the whole range of fluoride intakes or attempt to identify a “safe” level of fluoride exposure.

Dental fluorosis

The main reason for the recent changes in fluoridation levels (instituted in Canada and proposed in the U.S.) is the prevention of dental fluorosis, a condition ranging from mild spotting of the teeth to severe pitting and staining. Dental fluorosis is caused by excessive fluoride ingestion during the early years of childhood, before the permanent teeth erupt. The Canadian and proposed U.S. recommendations are intended to limit the risk of moderate (Canada) or severe (U.S.) dental fluorosis while maintaining caries protection (Health Canada 2010a; Federal Register 2011).

The most recent data indicate a fluorosis prevalence in the U.S. (all levels of severity) of 40.7% in 1999-2004 vs. 22.6% in 1986-1987 for children ages 12-15 (Beltrán-Aguilar et al. 2010). Canada reported a fluorosis prevalence of 16.4% (very mild and mild, with "very low levels of moderate and severe") among children ages 6-12 surveyed in 2007-2009 (Health Canada 2010a;c). Neither the more recent U.S. data nor the Canadian data report dental fluorosis prevalence with respect to local water fluoride concentrations. If the Canadian survey was representative with respect to local water fluoride concentrations, given a fluoridation rate of nearly one-half the population, one could reasonably expect that the fraction of children with fluorosis in fluoridated areas exceeds 20%.

The only U.S. study to have looked at dental fluorosis and individual fluoride intake at various ages (the Iowa study) reported that for children with fluoride intakes above 0.06 mg/kg/day during the first 3 years of life, fluorosis rates were as high as 50% (Hong et al. 2006b). As mentioned above, at a fluoride concentration of 0.7 mg/L in drinking water, many infants will have fluoride intakes at and above 0.07 mg/kg/day, and some will exceed 0.15 mg/kg/day (NRC 2006). Thus a large fraction of infants and young children fed formula made with fluoridated tap water can be expected to develop dental fluorosis even at a water fluoride concentration of 0.7 mg/L.

Health Canada (2010a) considers moderate dental fluorosis to be an adverse effect. The National Research Council considers severe dental fluorosis to be an adverse health effect and reports the general consensus in the literature that both severe and moderate dental fluorosis should be prevented (NRC 2006). Neither the Canadian nor U.S. authorities have addressed the costs to

treat the cosmetic appearance of fluorosed teeth, apart from whether dental fluorosis is considered "adverse" in terms of health.

The Iowa study indicates that high fluoride intake during the first 2 years of life is most important with respect to development of dental fluorosis of the permanent maxillary central incisors (the "top front teeth")—the teeth that most affect a person's appearance—although fluoride intake up to at least 4 years old was also important (Hong et al. 2006a). The American Dental Association has issued a brief statement to the effect that parents should not prepare infant formula with fluoridated water if they are concerned about the possibility of their child developing dental fluorosis (ADA 2007). This is an admission that dental fluorosis is undesirable, and that fluoridated tap water is not "safe" for all individuals.

Skeletal fluorosis

Bone fluoride concentrations in the ranges reported for stage II and III skeletal fluorosis will be reached by long-term fluoride exposures of 0.05 mg/kg/day or higher (estimated from NRC 2006). Chachra et al. (2010) recently reported bone fluoride content for residents of Toronto (fluoridated for 32-36 years at the time of the study) and Montreal (not fluoridated) who were undergoing total hip replacement surgery; most of the individuals had a diagnosis of osteoarthritis. Two of the 53 individuals in Toronto had bone fluoride concentrations in the range reported for skeletal fluorosis (NRC 2006), although both individuals would have been well into adulthood when exposure to fluoridated water began. The study did not include

exposure histories; nevertheless, it does indicate that bone fluoride concentrations in fluoridated Canadian cities can be in the range reported for skeletal fluorosis.

Bone fluoride concentrations, radiologic changes, and symptoms are not clearly correlated (Franke et al. 1975), and most U.S. studies do not categorize cases by stage. Recent case reports include fluorosis attributed to excessive ingestion of tea or toothpaste (Whyte et al. 2005; Hallanger Johnson et al. 2007; Kurland et al. 2007). Most of the literature addresses high fluoride exposures over a few years; there has been essentially no investigation of effects of low exposures over many years and no effort to identify fluorosis of any stage in the U.S. or Canada. “Arthritis” (defined as painful inflammation and stiffness of the joints) is a leading cause of disability in Canada and currently affects approximately 16.6% of Canadian adults (4.5 million people); more than half of Canadians with arthritis are less than 65 years old (Arthritis Society 2013). The possibility that a sizeable fraction of “bone and joint pain” or “arthritis” in Canadian (or U.S.) adults is attributable to fluoride exposure has not been addressed, although it is plausible, given what is known about fluoride intakes.

Increased risk of bone fractures

The NRC (2006) concluded that lifetime exposure to fluoride at an estimated average daily intake of 0.08 mg/kg/day (average adult fluoride intake with water at 4 mg/L) is likely to result in higher bone fracture rates, and the available information suggests an increased likelihood of bone fracture for daily fluoride intakes of 0.05 mg/kg/day (average adult fluoride intake at 2 mg/L). The Agency for Toxic Substances and Disease Registry (ATSDR) has identified a

chronic-duration Minimal Risk Level (MRL) for oral exposure to fluoride of 0.05 mg/kg/day, based on an increased risk of bone fracture (ATSDR 2003). The NRC's findings (NRC 2006) indicate that the ATSDR's MRL is not protective enough. The available studies consider fluoride intake only in terms of the concentration in the local drinking water, and most use fluoridated water (1 mg/L, corresponding to an average daily intake of 0.03 mg/kg/day for adults) as a control. Thus there is probably considerable overlap in exposures between groups, making effects more difficult to distinguish, and the entire dose response range of interest has not been well studied. The findings in humans are consistent with animal studies that have found increased brittleness of bones with increased fluoride exposure (Clark and Mann 1938; Turner et al. 1997; 2001).

Danielson et al. (1992) reported an increased relative risk for hip fracture in a fluoridated area of 1.27 (95% CI 1.08-1.46) for women and 1.41 (95% CI 1.00-1.81) for men. These authors reported a difference between women exposed to fluoride prior to menopause and those exposed afterwards. For women exposed prior to menopause, the fracture risk was considerably higher than for those not exposed to fluoride. Many studies of fracture risk have not looked at age-specific exposure, or have involved women exposed only after menopause, when fluoride uptake into bone is probably substantially lower.

The Iowa study has reported effects on bone mineral concentration and bone mineral density with average childhood fluoride intakes of 0.02-0.05 mg/kg/day (Levy et al. 2009). Linear correlation between dental fluorosis and risk of bone fracture has been reported for children and adults (Alarcón-Herrera et al. 2001; Fig. 5). Bone fracture rates in children in the U.S. may be

increasing (e.g., Khosla et al. 2003), but fluoride exposure has not been examined as a possible cause or contributor.

Carcinogenicity

Three U.S. courts have found water fluoridation to be injurious to human health, specifically that it may cause or contribute to the cause of cancer and genetic damage (described in detail by Graham and Morin 1999). The NRC's committee on fluoride toxicology unanimously concluded that “Fluoride appears to have the potential to initiate or promote cancers,” even though the overall evidence is “mixed” (NRC 2006). Referring to the animal studies, the committee also said that “the nature of uncertainties in the existing data could also be viewed as supporting a greater precaution regarding the potential risk to humans.” The committee discussed the limitations of epidemiologic studies, especially ecologic studies (those in which group, rather than individual, measures of exposure and outcome are used), in detecting small increases in risk—in other words, the studies are not sensitive enough to identify small or moderate increases in cancer risk; therefore a “negative” study does not necessarily mean that there is no risk (see also Cheng et al. 2007).

While the NRC did not assign fluoride to a specific category of carcinogenicity (i.e., known, probable, or possible), the committee did not consider either “insufficient information” or “clearly not carcinogenic” to be applicable. The committee report (NRC 2006) includes a discussion of how EPA establishes drinking water standards for known, probable, or possible carcinogens; such a discussion would not have been relevant had the committee not considered

fluoride to be carcinogenic. The question becomes one of how strongly carcinogenic fluoride is, and under what circumstances.

The case-control study by Bassin et al. (2006) is the only published study thus far to have looked at age-dependent exposure to fluoride. This study reported a significantly elevated risk of osteosarcoma in boys as a function of estimated age-specific fluoride intake. Osteosarcoma is a bone cancer that commonly results in amputation of an affected limb and may result in death. At the very least, this study indicates that similar studies of pediatric osteosarcoma that have not looked at age-dependent intake cannot be considered to show “no effect.” A recent review of osteosarcoma risk factors (Eyre et al. 2009) lists fluoride among “a number of risk factors that emerge with some consistency” and considers fluoride exposure to have a “plausible” role in etiology of osteosarcoma.

While a few other studies (e.g., Gelberg et al. 1995; Kim et al. 2011) have looked at individual fluoride exposure (as opposed to group or ecologic measures of exposure), these have looked at total fluoride exposure until time of diagnosis or treatment. Given that there is a “lag time” of a few years between onset of a cancer and its diagnosis, use of cumulative fluoride exposure until time of diagnosis is potentially misleading, as fluoride exposure during the last several years (during the “lag time”) cannot have contributed to the initiation of a cancer but could have a significant effect on the estimate of cumulative fluoride exposure. Kim et al. (2011) actually point out that “if risk is related to exposures at a specific time in life, rather than total accumulated dose, this metric [bone fluoride levels at the time of treatment] would not be optimal.” In addition, given that the median age of the controls used by Kim et al. (2011) was

more than twice the median age of the cases, and that the "median cumulative lifetime water fluoride" calculated for each group was similar, the findings of Kim et al. (2011) actually indicate higher average fluoride exposure among cases than controls, by a factor of about 2, supporting an association between fluoride exposure and osteosarcoma.

The 1990 National Toxicology Program (NTP) study on sodium fluoride officially concluded that "there was *equivocal evidence of carcinogenic activity* of sodium fluoride in male F344/N rats, based on the occurrence of a small number of osteosarcomas in dosed animals" (NTP 1990; italics in the original). According to the published report, a "small number of osteosarcomas occurred in mid- and high-dose male rats. These neoplasms occurred with a significant dose response trend, but at a rate within the upper range of incidences previously seen in control male rats in NTP studies" (NTP 1990). It is important to realize that the historic controls from previous studies had not had the special low-fluoride diet used for this study, and therefore more properly constitute a low- to mid-range exposed group rather than a control group. This and other concerns were described in a memo within the Environmental Protection Agency (Marcus 1990) and reported in the press (Hileman 1990). These concerns and the testimony before the U.S. Senate of the union representing EPA scientists (Hirzy 2000) should be taken seriously.

In humans, osteosarcomas tend to occur most commonly in young people (pediatric cases) or the very old (adult or geriatric cases), with a higher incidence in males than in females (Bassin et al. 2006). Sergi and Zwerschke (2008) indicate that 60-75% of cases are in patients between 15 and 25 years old. In the NTP 2-year study, fluoride exposure was begun when the animals were 6 weeks old, as is typical for NTP and similar studies (Hattis et al. 2004). Puberty in the rat

typically occurs at about 32 days of age in females and 42 days in males (e.g., Gray et al., 2004; Evans 1986). Thus, the age of 6 weeks in the NTP study probably corresponds to pubertal or post-pubertal animals. The cases of osteosarcoma in the rats were reported in the late stages of the test, and probably corresponded to geriatric osteosarcomas in humans. In Bassin's study, the age range for which the fluoride-osteosarcoma association was most apparent was for exposures at ages 4-12 years, with a peak for exposures at age 6-8 years (Bassin et al. 2006). Very likely, the fluoride exposures in most of the animal studies have started after the age corresponding to the apparent most susceptible age in humans, and thus these animal studies may have completely missed the most important exposure period with respect to initiation of the majority of human osteosarcomas. Therefore, this animal study cannot be interpreted as showing no evidence of causation for pediatric osteosarcoma, although, properly interpreted, it does show evidence for causation of geriatric osteosarcoma.

Genotoxicity

Genotoxicity, or the ability to damage the genetic material (genes and chromosomes) of cells, is considered indicative of potential carcinogenicity. A number of mammalian *in vitro* systems have shown dose-dependent cytogenetic or cell transformational effects from fluoride exposure (reviewed by NRC 2009). Several reports suggest an indirect or promotional mechanism, e.g., inhibition of DNA synthesis or repair enzymes, rather than a direct mutagenic effect (Lasne et al. 1988; Aardema et al. 1989; Aardema and Tsutsui 1995; Meng and Zhang 1997). Human cells seem to be much more susceptible to chromosome damage from fluoride than are rodent cells (Kishi and Ishida 1993).

A recent paper by Zhang et al. (2009) describes a new testing system for potential carcinogens, based on induction of a DNA-damage response gene in a human cell line. Sodium fluoride tests positive in this system, as do a number of other known carcinogens, representing a variety of genotoxic and nongenotoxic carcinogenic mechanisms. Known noncarcinogens—chemicals not associated with carcinogenicity—did not test positive. The system described by Zhang et al. (2009) is considerably more sensitive than the older systems for most chemicals examined; a positive effect was seen at a fluoride concentration of about 0.5 mg/L, or a factor of 10 lower than in other systems.

A fluoride concentration of 0.5 mg/L in urine will routinely be exceeded by many people consuming fluoridated water (NRC 2006); for people with substantial fluoride intake, serum fluoride concentrations may also reach or exceed 0.5 mg/L. Acute fluoride exposures (e.g., accidental poisoning, fluoride overfeeds in drinking water systems) have resulted in fluoride concentrations in urine well in excess of 5 mg/L in a number of cases (e.g., Penman et al. 1997; Björnhagen et al. 2003; Vohra et al. 2008). Urine fluoride concentrations can also exceed 5 mg/L if chronic fluoride intake is above about 5-6 mg/day (0.07-0.09 mg/kg/day for an adult; based on NRC 2006). Thus, kidney and bladder cells are probably exposed to fluoride concentrations in the ranges at which genotoxic effects have been reported *in vitro*, especially when the more sensitive system of Zhang et al. (2009) is considered. Based on the results of Zhang et al. (2009), most tissues of the body are potentially at risk if serum fluoride concentrations reach or exceed 0.5 mg/L. In addition, cells in the vicinity of resorption sites in

fluoride-containing bone are potentially exposed to very high fluoride concentrations in extracellular fluid (NRC 2006) and thus are also at risk for genotoxic effects.

Endocrine effects

Health Canada (2010a) claims that there is no evidence that fluoride is an endocrine disruptor. However, based on an extensive review, the NRC (2006) concluded that fluoride is an endocrine disruptor. Endocrine effects include altered thyroid function or increased goiter prevalence (at fluoride intakes of 0.05-0.1 mg/kg/day, or 0.01-0.03 mg/kg/day with iodine deficiency), impaired glucose tolerance (at fluoride intakes above 0.07 mg/kg/day), a decrease in age at menarche in girls in fluoridated towns, and disruptions in calcium metabolism (calcitonin and parathyroid function, at fluoride intakes of 0.06-0.15 mg/kg/day or higher). ATSDR's toxicological profile for fluoride (ATSDR 2003) refers to an animal study of thyroid function that would give a lower MRL (value not given) than the MRL derived for bone fracture risk (0.05 mg/kg/day).

Thyroid dysfunction and Type II diabetes presently pose substantial health concerns in both the U.S. and Canada (NRC 2006; PHAC 2011). More than 2 million Canadians (7% of the population) are diabetic (PHAC 2011), and some 10% of Canadians have some form of thyroid disease (TFC 2014). Of particular concern is an inverse correlation between subclinical maternal hypothyroidism and the IQ of the offspring (NRC 2006). In addition, maternal subclinical hypothyroidism has been proposed as a cause of or contributor to development of autism in the child (Román 2007; Sullivan 2009). Steingraber (2007) has described the decrease in age at

puberty of U.S. girls and the associated increased risk of breast cancer. Calcium deficiency induced or exacerbated by fluoride exposure may contribute to other health effects (NRC 2006).

Increased blood lead levels

An increased likelihood of elevated blood lead levels is associated with use of silicofluorides (usually H_2SiF_6 or Na_2SiF_6) as the fluoridating agent (NRC 2006; Coplan et al. 2007). Most fluoridated water systems in Canada and the U.S. use silicofluorides (NRC 2006; CDA 2009). The chemistry and toxicology of these agents, especially at low pH (e.g., use of fluoridated water in beverages such as tea, soft drinks, or reconstituted fruit juices), have not been adequately studied (NRC 2006). Associations between silicofluoride use and biological effects in humans have been reported, in particular, elevated levels of blood lead in children and inhibition of acetylcholinesterase activity (reviewed by Coplan et al. 2007). A recent study in rats found significantly higher concentrations of lead in both blood and calcified tissues of animals exposed to both silicofluorides and lead (Sawan et al. 2010).

In addition to biological effects of silicofluorides, the interaction of silicofluorides (as the fluoridating agent) and disinfection agents (specifically, chloramines) also increases the leaching of lead from plumbing fixtures into drinking water (Maas et al. 2005; 2007). For example, the interaction of silicofluorides and chloramines is the probable explanation for the high lead levels in drinking water and children's blood in Washington, D.C. a few years ago (Maas et al. 2005; 2007; Leonnig 2010). EPA considers lead to be a probable human carcinogen and to have no

practical threshold with respect to neurotoxicity (EPA 2004b)—in other words, there is considered to be no safe level of lead exposure, and the MCLG for lead is zero (EPA 2012).

Neurotoxicity

Grandjean and Landrigan (2006) listed fluoride as an “emerging neurotoxic substance” that needed further in-depth studies. In a follow-up paper (Grandjean and Landrigan 2014), they list fluoride as a documented developmental neurotoxicant. The major concern is neurotoxic effects during human development. The NRC (2006) concluded that “it is apparent that fluorides have the ability to interfere with the functions of the brain and the body by direct and indirect means.” A number of studies indicate an association of fluoride exposure with lower IQ in children and with other measures of neuropsychological development (reviewed by NRC 2006; Connett et al. 2010; Choi et al. 2012; see also Zhao et al. 1996; Lu et al. 2000; Xiang et al. 2003; Rocha-Amador et al. 2007; 2009; Saxena et al. 2012; Seraj et al. 2012). Fluoride is known to cross the placenta in humans (Feltman 1956; Feltman and Kosel 1961; Gedalia et al. 1964; Hanhijärvi et al. 1974; Ron et al. 1986; Malhotra et al. 1993; Gupta et al. 1993; Shimonovitz et al. 1995), and several studies have shown changes in brain chemistry in fetuses due to maternal fluoride exposures (Dong et al. 1997; Du et al. 2008; He et al. 2008; Yu et al. 2000; 2008).

Additional adverse health effects

Fluoride intake is likely to affect the male reproductive-hormone environment, beginning at intakes of around 0.05 mg/kg/day (reviewed by NRC 2009). A “safe” intake with respect to male reproductive effects is probably somewhere below 0.03 mg/kg/day.

The NRC has reviewed the possible association between exposure to fluoridated water (approximately 0.02 mg/kg/day for adults) and increased risk of Down syndrome (trisomy 21) in children of young mothers, discussed a possible mechanism, and recommended further study (NRC 2006). Fetuses with Down syndrome are less likely to survive to birth, due both to higher natural fetal loss and to a high rate of pregnancy termination (Buckley and Buckley 2008; Forrester and Merz 1999; Siffel et al. 2004; Biggio et al. 2004).

Hypersensitivity or reduced tolerance to fluoride has been reported for exposure to fluoridated water (approximately 0.02 mg/kg/day for adults) or use of fluoride tablets (approximately 1 mg/day). Symptoms include skin irritation, gastrointestinal pain and symptoms (nausea, vomiting, diarrhea, constipation), urticaria, pruritus, stomatitis, chronic fatigue, joint pains, polydipsia, headaches, and other complaints (Waldbott 1956; 1958; Feltman 1956; Feltman and Kosel 1961; Grimbergen 1974; Petraborg 1977; Spittle 2008; reviewed by NRC 2006). Patients were often unaware that their drinking water contained fluoride. Symptoms improved with avoidance of fluoridated water and recurred with consumption of fluoridated water or with experimental challenge with sodium fluoride. Double-blind tests of patients have confirmed hypersensitivity to fluoride (Grimbergen 1974; Waldbott 1956; 1958). Many of the observed

symptoms represent true allergic phenomena, while others (e.g., gastrointestinal symptoms) could be due to a lower level of tolerance for fluoride (intoxication at lower exposure; Waldbott 1956; 1958).

Summary

The available data, responsibly interpreted, indicate a variety of possible adverse health effects in humans associated with fluoride exposures, at the levels experienced by people with fluoridated drinking water.

(3) By fluoridation of drinking water, governments and water suppliers are indiscriminately administering a drug to the population, without individual evaluation of need, appropriate dose, efficacy, or side effects.

Health Canada (2013) includes as "drug products" several toothpastes and mouthwashes that contain sodium fluoride as an active ingredient. The U.S. Food and Drug Administration (FDA) considers fluoride in toothpaste to be a non-prescription drug (e.g., FDA undated-a; undated-b) and fluoride "supplements" (usually tablets or lozenges) to be prescription drugs (e.g., Medline Plus 2008). Most prescription fluoride supplements in the U.S. are considered unapproved drugs (for example, see DailyMed 2011a,b,c), meaning that they "may not meet modern standards of safety, effectiveness, quality, and labeling" (FDA 2011). The goal of community water fluoridation is to provide a dental health benefit to individuals and to the population generally (Federal Register 2010; Health Canada 2011b; CDA 2009). EPA's recent reference (Federal

Register 2010) to a “treated population” acknowledges this use of drinking water systems to deliver a drug to entire populations. The Canadian Dental Association (CDA 2009) claims that “Adding fluoride to water is the best way to provide fluoride protection to a large number of people. . . it benefits all residents in a community.” This approach, in both the U.S. and Canada, in effect puts local governments and water treatment personnel in charge of administering a chemical (i.e., a drug) to the population in an effort to improve individual and population health (Cross and Carton 2003; Cheng et al. 2007). Many people consume more fluoride from tap water than from either non-prescription (toothpaste) or prescription (tablets or lozenges) fluoride sources, without any monitoring for either efficacy or side effects, without the “drug information” or warning labels generally provided for drugs, and without any semblance of informed consent.

In addition, most fluoridation operations use fluorosilicates (usually H_2SiF_6 or Na_2SiF_6) rather than sodium fluoride (NaF). The chemistry and toxicology of these compounds have not been adequately studied, although important differences in biological effects between silicofluorides and simple fluorides (e.g., NaF) have been reported (Coplan et al. 2007; NRC 2006; Masters et al. 2000; Masters and Coplan 1999). The NRC (2006) discussed the increased toxicity of aluminofluorides and beryllofluorides vs. fluoride alone, as well as the different mechanisms of action of the different chemical combinations. It is irresponsible to recommend addition of fluoride, or a particular concentration of fluoride to be added, without a comprehensive review of the substances (H_2SiF_6 or Na_2SiF_6 ,) that are actually added. In addition, fluoridation chemicals often contain impurities such as lead and arsenic (Brown et al. 2004; Weng et al. 2000; Casale 2001; Mullenix 2014). The U.S. EPA has set MCLGs of zero for both lead and arsenic (EPA

2012). Health Canada (2006; 2012) states that levels of arsenic in drinking water should be as low as reasonably achievable and exposures to lead should be kept to a minimum. Thus, by adding fluoridation chemicals, a water supplier is also adding contaminants for which the ideal maximum amount in drinking water is zero.

In summary, it is irresponsible to promote or encourage uncontrolled exposure of any population to a drug that, at best, is not appropriate for many individuals (e.g., those who do not want it, those whose water consumption is high, formula-fed infants, people with impaired renal function) and for which the risks are inadequately characterized and inadequately disclosed to the public.

(4) Expected fluoride intakes in fluoridated communities in Ontario, compared with "no-effect" levels for adverse health effects.

Table 2 summarizes the estimated intake of water from community (municipal) water sources. These estimates are based on U.S. data (EPA 2004a), but are expected to be reasonably representative of the Canadian population as well. Intakes are summarized in terms of the volume per day (mL per day) and the volume per unit body weight per day (mL per kg body weight per day). Data are summarized by age group (both sexes included) and include both direct and indirect intake for consumers only (people who actually consume municipal water). Data are summarized in terms of an average intake, a typical range of intake among consumers, and a value representative of high consumers (but not necessarily a maximum value).

Table 3 provides a summary of estimated fluoride intakes from community water sources for four concentrations of fluoride in drinking water relevant to the situation in Ontario (targeted range of 0.5-0.8 mg/L, Health Canada's "optimal" level of 0.7 mg/L, maximum allowable concentration of 1.5 mg/L). These estimates are based on the water consumption rates (mL per kg per day) in Table 2. Note that these fluoride intakes represent only fluoride from municipal water sources; they do not include fluoride intakes from other sources (e.g., toothpaste, tea, food). Thus, total fluoride intakes would be expected to be higher than the values provided in Table 3 for a given situation.

Figures 6 and 7 summarize estimated fluoride intakes (from community water alone) from Table 3, together with "no-effect" levels identified for various adverse health effects. Note that for the entire population to be protected against a particular adverse health effect, the upper end of the intake range for all subsets (e.g., age groups) of the population must be at or below the "no-effect" level. Note also that these "no-effect" levels do not include any margin of safety for protection of individuals with greater susceptibility or higher exposure.

Table 1. Caries prevalence and fluorosis prevalence with water fluoride concentration.^a

Water fluoride concentration mg/L	Children with no caries %	Mean DMFS score ^b	Children with fluorosis ^c %	Mean severity of fluorosis ^d
< 0.3	53.2	3.08	13.5	0.30
0.3 - < 0.7	57.1	2.71	21.7	0.43
0.7 - 1.2	55.2	2.53	29.9	0.58
> 1.2	52.5	2.80	41.4	0.80

^a Data for permanent teeth of children ages 5-17 (caries experience and DMFS score) or 7-17 (dental fluorosis), with a history of a single residence, from Tables 2 and 5 of Heller et al. (1997).

^b Decayed, missing, or filled tooth surfaces (permanent teeth).

^c Includes very mild, mild, moderate, and severe fluorosis, but not "questionable."

^d Dean's Community Fluorosis Index.

Table 2. Estimated intake of water from community sources by age group.^a

Age group	Average consumption	Typical Range	High consumers
Intake (mL per day)			
Infants < 1 year	502	28-1147	1517
Children 2-10 years	431	29-1137	1722
Youth 11-19 years	736	58-1973	3689
Adults 20+ years	1176	103-2848	4631
Intake per unit body weight (mL per kg per day)			
Infants < 1 year	71	3-185	261
Children 2-10 years	21	1-57	92
Youth 11-19 years	13	1-34	60
Adults 20+ years	16	1-39	62

^a Based on U.S. data (EPA 2004a). Intakes include both direct and indirect intake for consumers only, both sexes combined.

Table 3. Estimated intake of fluoride from fluoridated community water sources (mg F per kg body weight per day), for selected concentrations of fluoride in community water, by age group (both sexes combined) and level of water consumption.^a

Age group	Average consumption	Typical Range	High consumers
0.5 mg/L fluoride			
Infants < 1 year	0.036	0.0015-0.093	0.131
Children 2-10 years	0.011	0.0005-0.029	0.046
Youth 11-19 years	0.0065	0.0005-0.017	0.030
Adults 20+ years	0.0080	0.0005-0.020	0.031
0.7 mg/L fluoride			
Infants < 1 year	0.050	0.0021-0.130	0.183
Children 2-10 years	0.015	0.0007-0.040	0.064
Youth 11-19 years	0.0091	0.0007-0.024	0.042
Adults 20+ years	0.011	0.0007-0.027	0.043
0.8 mg/L fluoride			
Infants < 1 year	0.057	0.0024-0.148	0.209
Children 2-10 years	0.017	0.0008-0.046	0.074
Youth 11-19 years	0.010	0.0008-0.027	0.048
Adults 20+ years	0.013	0.0008-0.031	0.050
1.5 mg/L fluoride			
Infants < 1 year	0.107	0.0045-0.278	0.392
Children 2-10 years	0.032	0.0015-0.086	0.138
Youth 11-19 years	0.020	0.0015-0.051	0.090
Adults 20+ years	0.024	0.0015-0.059	0.093

^a Based on U.S. data (EPA 2004a) for water consumption as summarized in Table 2.

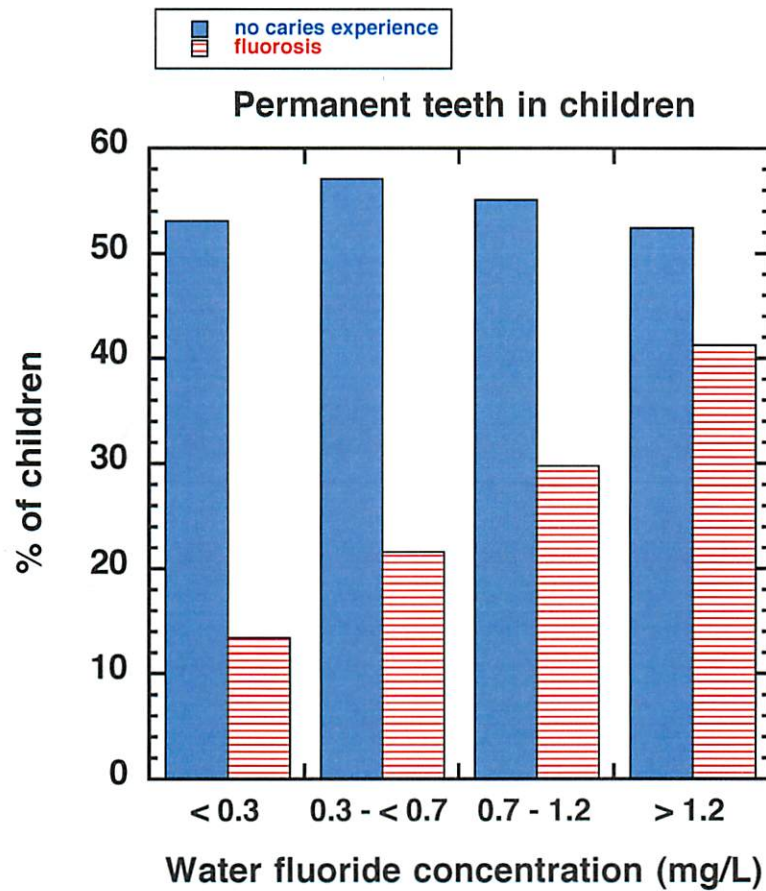


Fig. 1. Percent of children with no caries experience in the permanent teeth (DMFS = 0) and with fluorosis, with respect to water fluoride concentration. Data are shown as % of total children having no caries experience (blue) or having fluorosis (very mild, mild, moderate, or severe, but not questionable; red). Numerical values are provided in Table 1 of these comments and were obtained from Tables 2 and 5 of Heller et al. (1997).

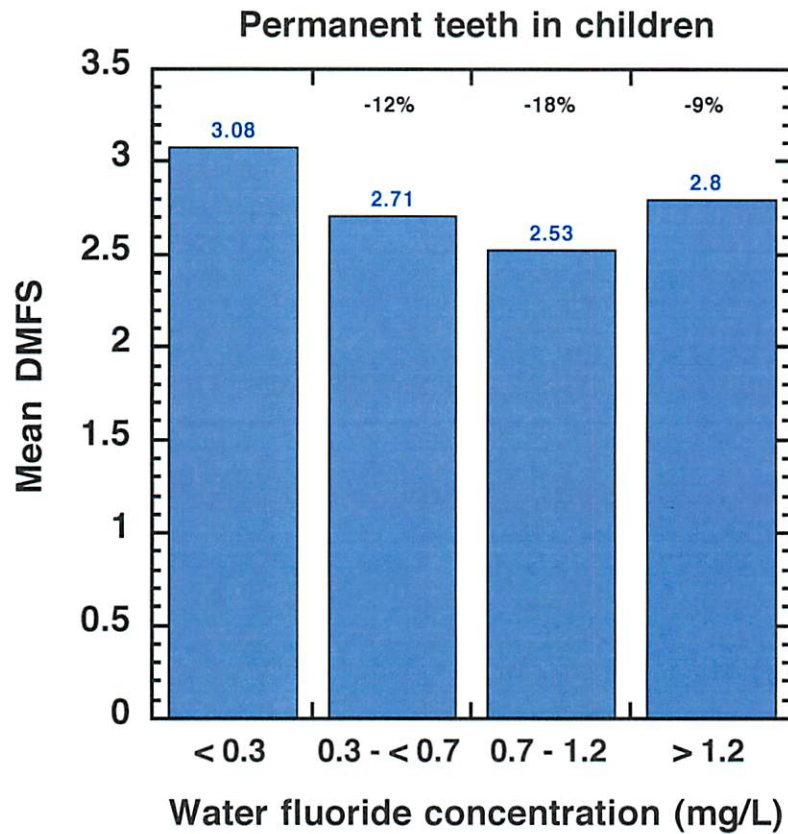


Fig. 2. Mean DMFS score (decayed, missing, or filled permanent tooth surfaces in permanent teeth), with respect to water fluoride concentration. Numerical values are provided in Table 1 of these comments and were obtained from Table 2 of Heller et al. (1997). The percent difference with respect to the lowest fluoride group is also provided.

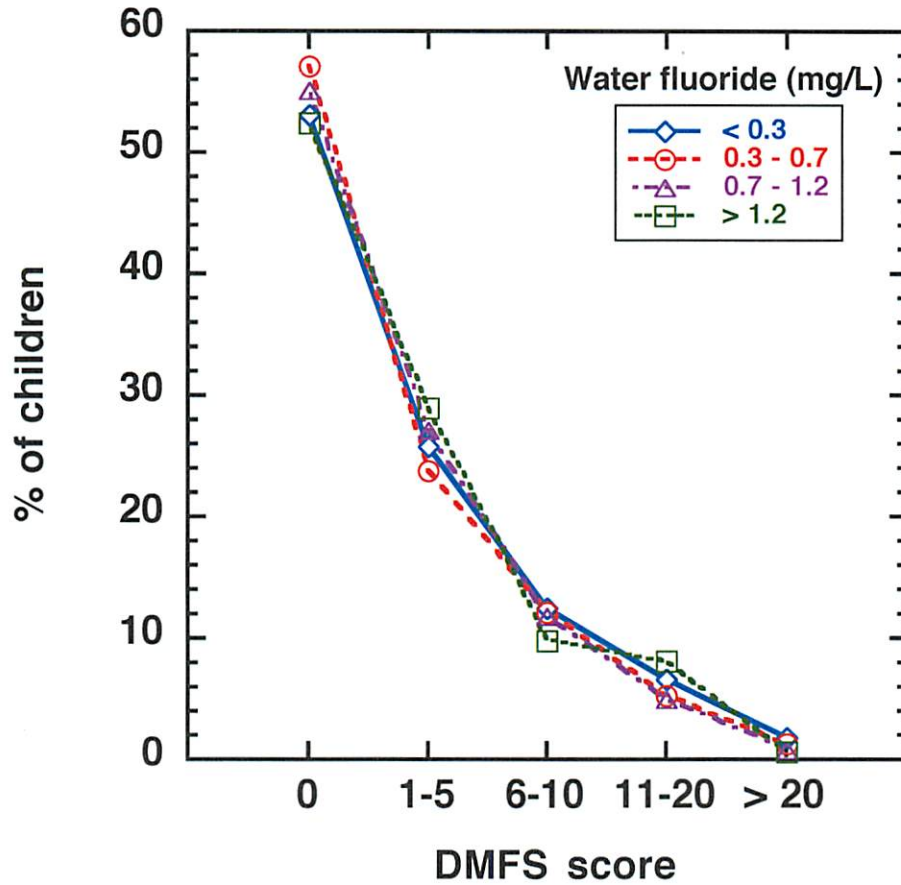


Fig. 3. Percent of children by DMFS score, with respect to water fluoride concentration. Data are shown as % of total children in a given group according to the number of decayed, missing, or filled tooth surfaces in the permanent teeth (DMFS). Data were obtained from Table 2 of Heller et al. (1997).

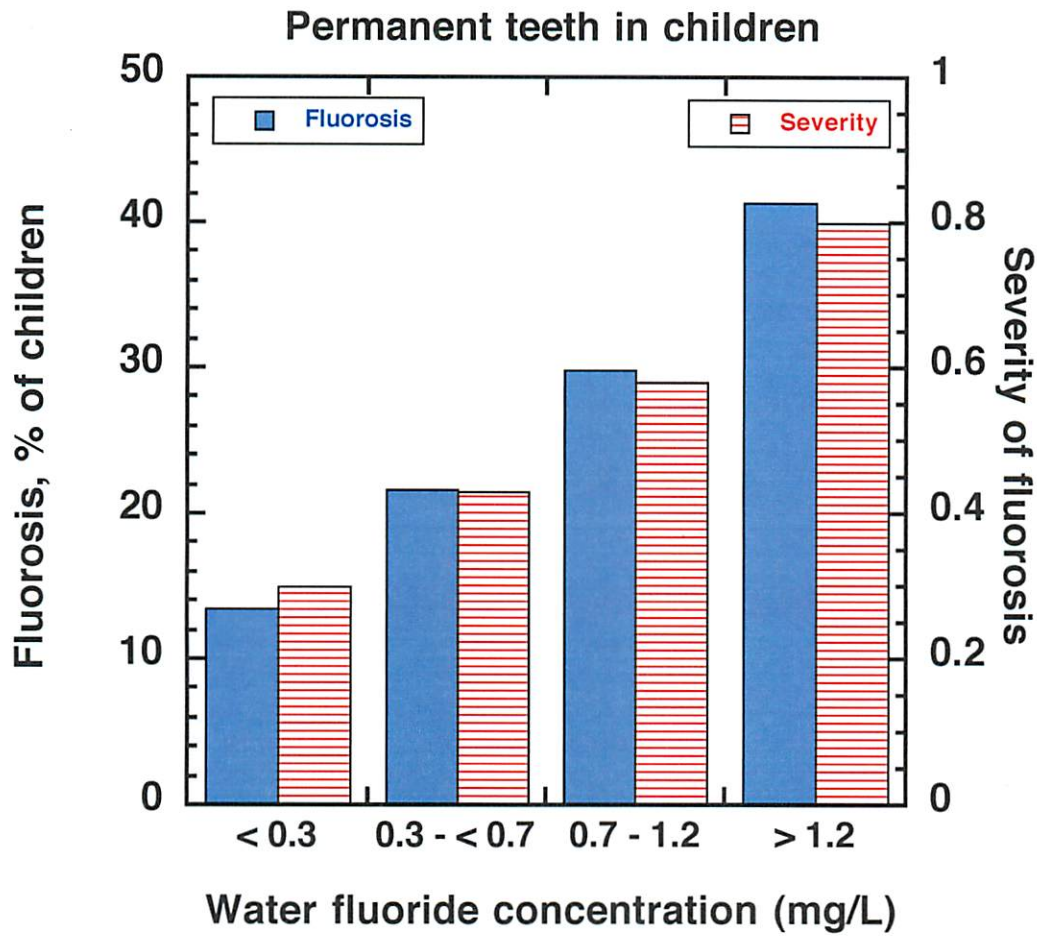


Fig. 4. Fluorosis prevalence and severity with water fluoride concentration for children ages 7-17 with a history of a single continuous residence. Data are shown as (left) % of total children having fluorosis (very mild, mild, moderate, or severe, but not questionable) or (right) severity of fluorosis by Dean's Community Fluorosis Index. Numerical values are provided in Table 1 of this affidavit and were obtained from Table 5 of Heller et al. (1997).

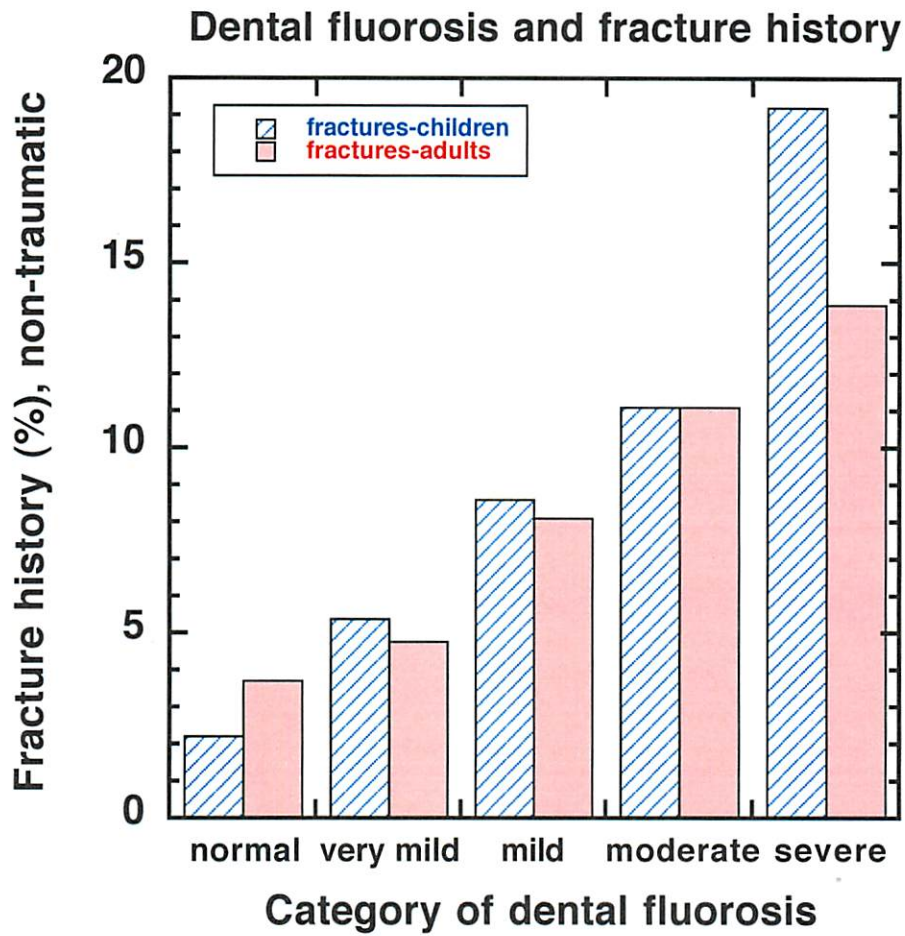


Fig. 5. Fracture history with category of dental fluorosis for children (ages 6-12) and adults (ages 13-60). Numerical values were obtained from information in Tables 5 and 6 of Alarcón-Herrera et al. (2001).

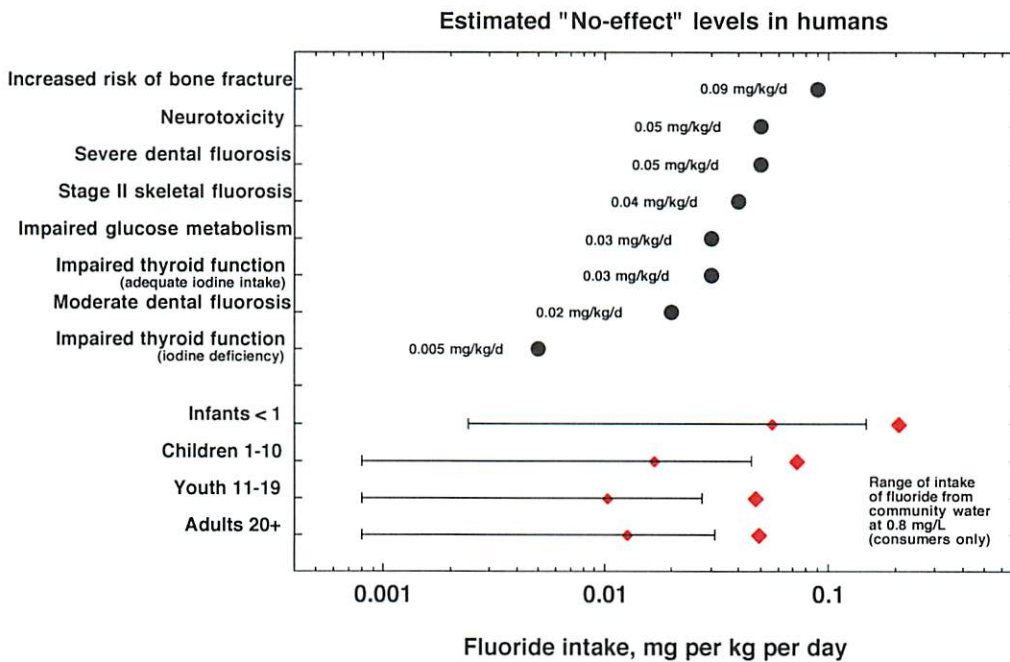
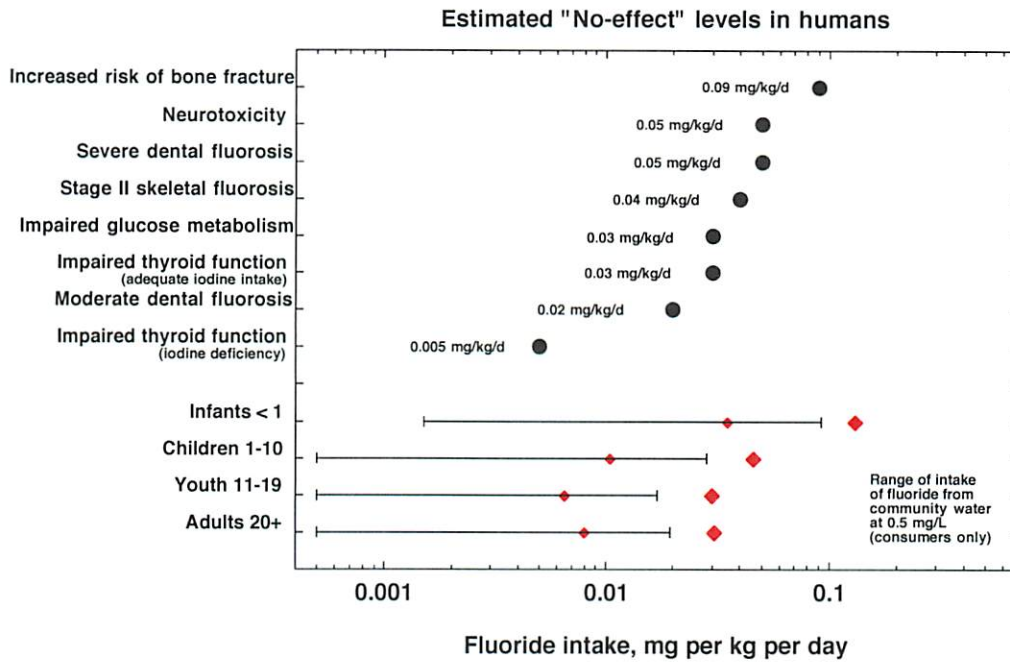


Fig. 6. Comparison of estimated fluoride intakes from community water alone (from Table 3) at the lower and upper limits of the targeted fluoride concentrations for Ontario, 0.5 mg/L (top) and 0.8 mg/L (bottom), with estimated "no-effect" levels of fluoride intake in humans.

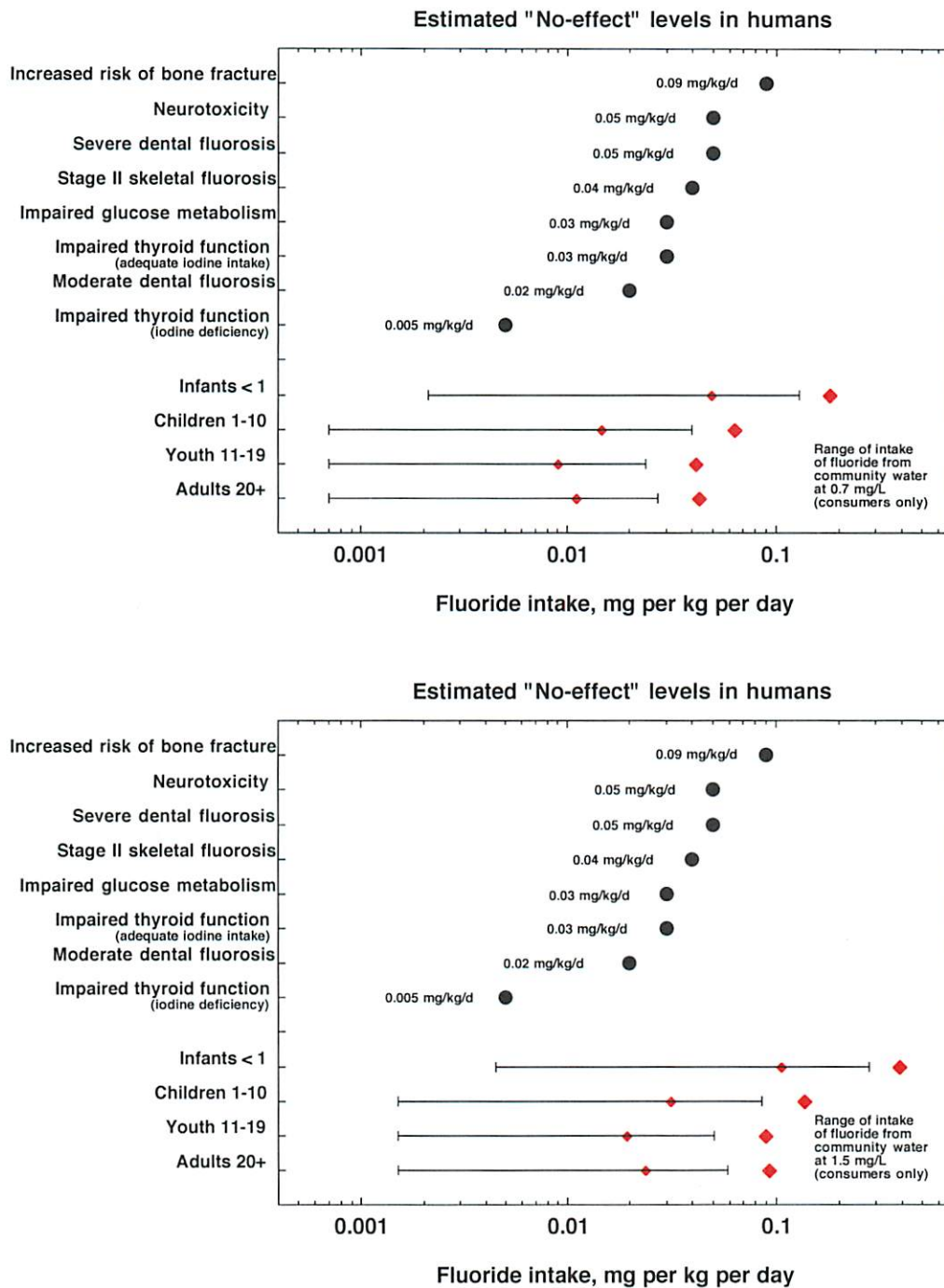


Fig. 7. Comparison of estimated fluoride intakes from community water alone (from Table 3) at Health Canada's "optimal" fluoride concentration, 0.7 mg/L (top), and Maximum Allowable Concentration, 1.5 mg/L (bottom), with estimated "no-effect" levels of fluoride intake in humans.

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Sworn before me at the City of Oak Ridge)
in the State of Tennessee this 29th day)
of April, 2014.)

Kimberly H. Disney
NOTARY


Kathleen M. Thiessen
KATHLEEN THIESSEN

10/1/2014

2014

[Faint handwritten signature]

[Handwritten signature]
KIMBERLY H. DISNEY
NOTARY PUBLIC
ANDERSON COUNTY
STATE OF TENNESSEE
Commission Expires 02-21-2018

Cycling Advisory Committee

Report

2nd Meeting of the Cycling Advisory Committee
January 16, 2019
Committee Room #4

Attendance PRESENT: D. Mitchell (Chair), D. Doroshenko, R. Henderson,
J. Jordan, W. Pol, D. Szoller; and P. Shack (Secretary)

ABSENT: D. Foster, R. Sirois and M. Zunti

ALSO PRESENT: J. Ackworth, J. Bruin, A. Giesen, K.
Grabowski, S. Harding, P. Kavcic, T. Koza, L. Maitland, A. Miller,
J. Stanford and S. Wilson

The meeting was called to order at 12:25 PM.

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that no pecuniary interests were disclosed.

2. Scheduled Items

2.1 Wonderland Road Class Environmental Assessment Study

That it BE NOTED that the attached presentation from J. Johnson, Project Manager, Dillon Consulting, with respect to the Wonderland Road Class Environmental Assessment Study, was received.

2.2 Thames Valley Corridor: SOHO

That it BE NOTED that the attached presentation from K. Preston, Associate, Dillon Consulting, with respect to the Thames Valley Corridor: SOHO, was received.

2.3 Update on Bike Share Activities and Development of Business Case

That it BE NOTED that the attached presentation from J. Stanford, Director-Environmental, Fleet and Solid Waste and A. Miller, Co-ordinator Transport Demand Management, with respect to an update on Bike Share Activities and Development of Business Case, was received.

2.4 East-West Bikeway Evaluation

That it BE NOTED that the attached presentation from P. Kavcic, Transportation Design Engineer, with respect to the East-West Bikeway Evaluation, was received.

3. Consent

3.1 1st Report of the Cycling Advisory Committee

That it BE NOTED that the 1st Report of the Cycling Advisory Committee, from its meeting held on December 19, 2018, was received.

3.2 West London Dyke Erosion Control-Municipal Class Environmental Assessment-Notice of Study Completion

That it BE NOTED that the Notice of Study Completion-West London Dyke Erosion Control-Municipal Class Environmental Assessment, was received.

3.3 Notice of Planning Application - Official Plan Amendment - Victoria Park Secondary Plan

That it BE NOTED the Notice of Planning Application-Official Plan Amendment-Victoria Park Secondary Plan, was received.

3.4 Bicycle Lane over Blackfriars Bridge - M. Temme

That the following action be taken with respect to the communication from M. Temme dated December 12, 2018, concerning the bicycle lane over Blackfriars Bridge:

that Civic Administration BE REQUESTED to consider on-site monitoring of the use of the bridge to ensure that cyclists are not comprised, and the information be shared with Cycling Advisory Committee;

it being noted that the communication with respect to the above matter, was received.

3.5 Greg Cunroe Tunnel Repairs (6-PT-02) Horton Street to Evergreen Avenue Under CN Rail - Tender No. RFT-18-22

That it BE NOTED that the communication dated January 8, 2019 from J. Fullick with respect to the Greg Cunroe Tunnel Repairs (6-PT-02) Horton Street to Evergreen Avenue under CN Rail, was received.

4. Sub-Committees and Working Groups

None.

5. Items for Discussion

5.1 (ADDED) Budget

That Civic Administration BE ADVISED of the following comments with respect to the 2020-2025 Budget for Cycling:

a) to continue support and explore opportunities to maintain the 2016-2019 allocation budget for Cycling;

b) be encouraged to pursue Senior Levels of Government to replace lost funding;

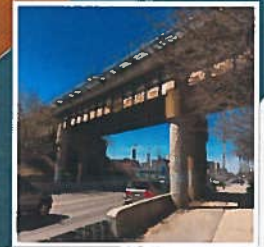
it being noted that the Cycling Advisory Committee (CAC) held a general discussion with respect to the 2020-2025 Budget for Cycling.

6. Deferred Matters/Additional Business

None.

7. Adjournment

The meeting was adjourned at 6:30 PM.



Wonderland Road Improvements

Class Environmental Assessment Study

Cycling Advisory Committee Presentation

Purpose of this meeting:

To introduce the project and solicit participation from committee members throughout the EA process

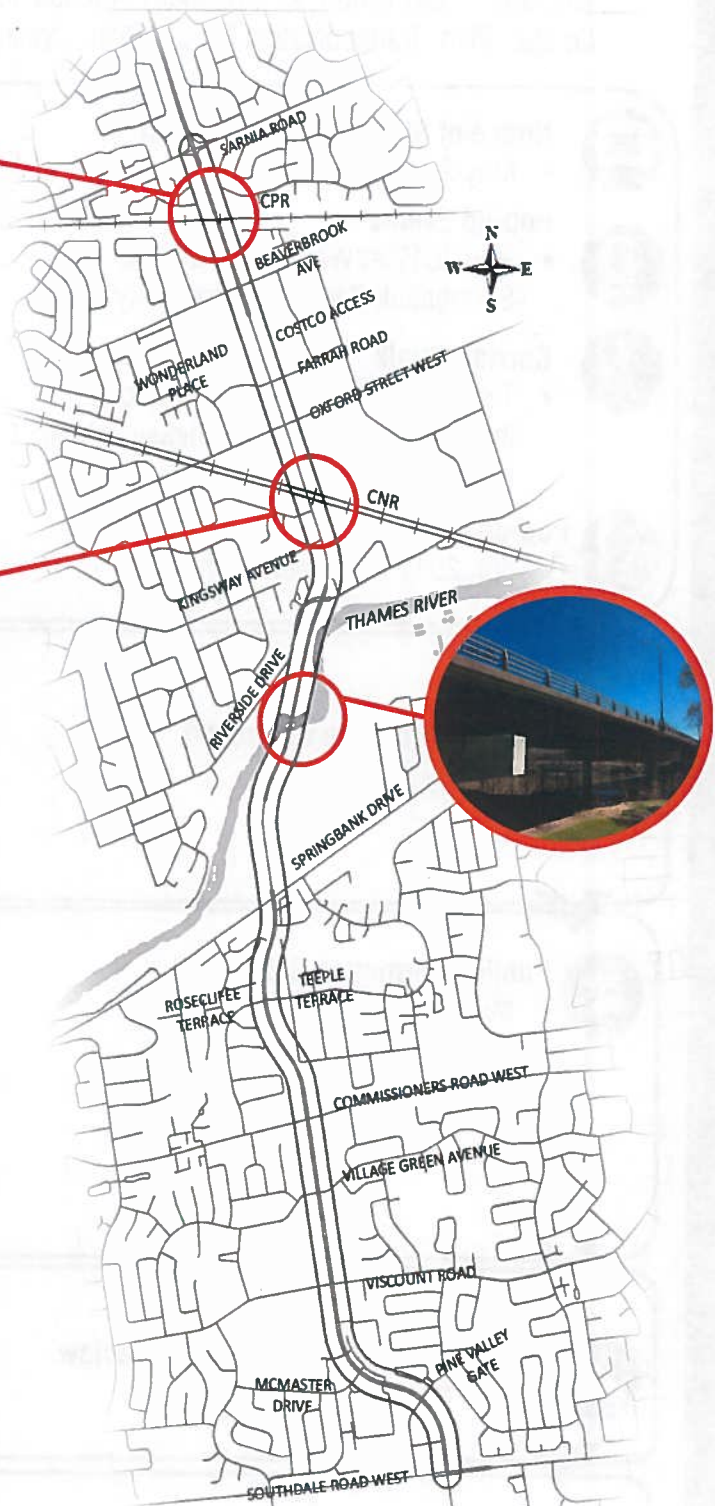


PROBLEM AND OPPORTUNITY STATEMENT

Recognizing the important role Wonderland Road has in the City of London as a key north-south transportation corridor, the 2030 Transportation Master Plan identified the need to widen Wonderland Road from four to six lanes, from Sarnia Road to Southdale Road as a strategic improvement. The City initiated a Schedule C Municipal Class Environmental Assessment (EA) (2000, as amended) to confirm the need for the widening and to identify the opportunity for additional improvements along the corridor. The outcome of the study will provide the basis for implementing an optimized corridor that addresses multi-model transportation needs, servicing, urban design and accessibility.



STUDY AREA



Wonderland Road is a critical north-south corridor in the City, with a variety of neighbourhoods, businesses and other uses along the road.

- Study area extends from Sarnia Road to Southdale Road West (approx. 7 km)
- Wonderland Road connects to Highway 402 and Highway 401 south of the project limits
- Wonderland Road was recently designated as Highway 4 through London, (between Highway 401 and Sunningdale Road)
- Project will be designed to integrate with the design completed as part of the 2015 Wonderland Road South Class EA which extended from Highway 402 to Southdale Road West.

STUDY PROCESS

The study is following the requirements of a Schedule 'C' Municipal Class Environmental Assessment (EA) (2000, as amended) process and will build on the recommendations of the London Plan, Transportation Master Plan, Cycling Master Plan and other relevant studies.



Notice of Study Commencement

- May 2017



Pop-up Events

- July 2017 at Westmount Mall & Springbank Gardens Community Centre



Corridor Walk

- Team members delivered project information cards to businesses along Wonderland Road Aug, 2017



Pop-up Event

- Sept. 2017 at Western University

Phase 1

Problem/ Opportunity

- Identify problems/ opportunities to be addressed in the planning and design process
- Confirm the need for improvements
- Prepare a "Problem Statement"



Public Information Centre #1

- January 2019

Phase 2

Alternative Solutions

- Document existing and future conditions
- Develop alternative solutions
- Consult with review agencies and the public



Public Information Centre #2

- Mid to late 2019

Phase 3

Design Options for Preferred Solution

- Identify design options for the preferred solution
- Evaluate design options and select a preferred design
- Impact assessment of the preferred design



Publish ESR for 30-Day Public Review

- Late 2019

Phase 4

Environmental Study Report (ESR)

- Document the decision-making process for public and agency review



Construction Start

- Potentially 2023 subject to council approval and permitting

Phase 5

Implementation

- Design and construction Phase
- Project must be designed and constructed as outlined in the ESR









EXISTING CONDITIONS: RECREATION & ACTIVE TRANSPORTATION



- Existing sidewalks along both sides of Wonderland Road for the length of the corridor
- Much of the corridor has separated “in-boulevard” cycling facilities on both sides of the road
- No cycling facilities on Wonderland Road from Commissioners Road West to Southdale Road West
- Wonderland Road is an important access point to the Thames Valley Parkway
- Wonderland Gardens recreation venue located north of Springbank Drive.



WHAT APPROACHES ARE BEING CONSIDERED TO IMPROVE THE CORRIDOR?

Possible Planning Solutions	Description	Key Considerations	Does it Address the Problems and Opportunities
 <p>Do Nothing</p>	<p>No capital improvements. Continue operation and maintenance of the four-lane roadway</p>	<p>Not consistent with City's long-term transportation planning network or The London Plan</p>	
 <p>Address traffic signal timing</p>	<p>Revise traffic signal timing at intersections along the corridor to improve traffic flow</p>	<p>Traffic signal synchronization is like a web: if you change the timing in one direction, it will affect all the intersections surrounding it, causing a ripple effect</p> <p>Traffic signal timings are regularly reviewed along Wonderland Road and across the City. Modifications were made in 2018. There are limitations to signal optimization alone, including roadway capacity constraints.</p>	<p>Yes – provides some improvement along the corridor</p> 
 <p>Transportation Demand Management (TDM)</p>	<p>Reduce periods of peak traffic demands by shifting the timing of travel and increasing alternative modes of travel (transit, cycling, walking)</p>	<p>TDM policies included in the City's Transportation Master Plan are being implemented throughout the City</p>	<p>Implementation ongoing through other City programs</p> 
 <p>Increase Capacity</p>	<p>Widen Wonderland Road from 4 to 6 through lanes throughout the corridor</p>	<p>Consistent with City's long-term transportation planning network</p> <p>Analysis completed shows the majority of the corridor is forecasted to meet or exceed capacity by 2034 if not widened</p>	<p>Consistent with the Transportation Master Plan and addresses Problems/ Opportunities</p> 

Based on the results of the analysis the recommendations include:

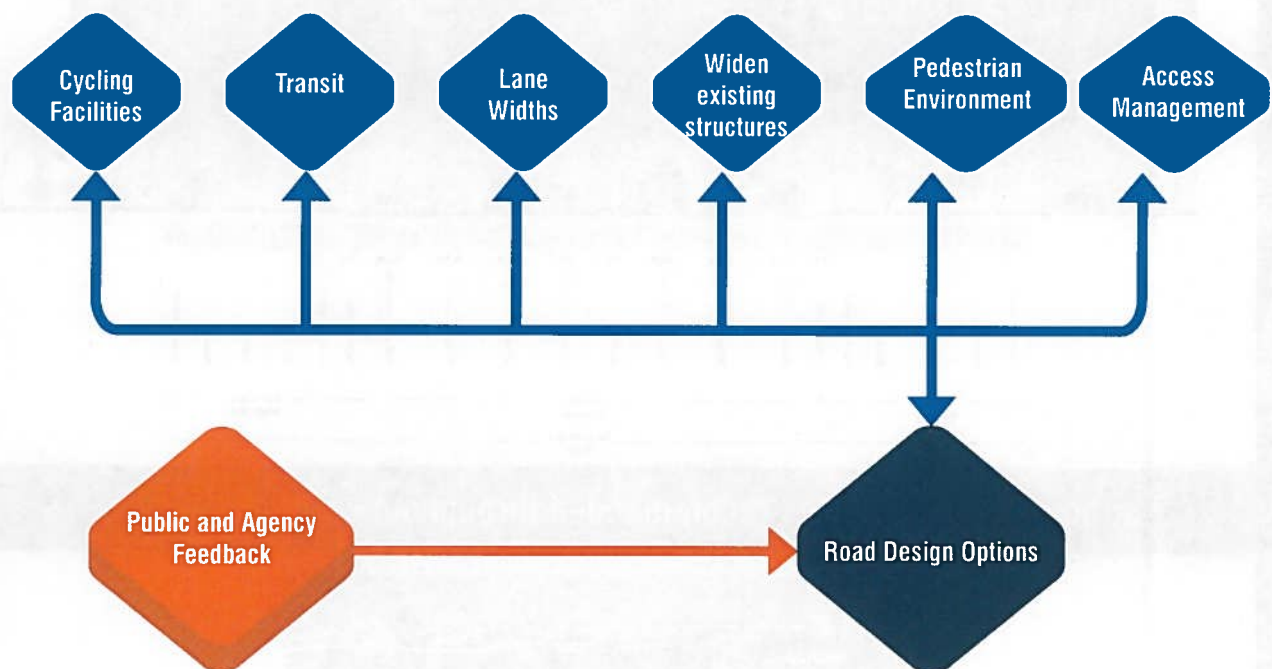
- Continue to monitor traffic signal synchronization and optimize as required. This will be completed while the planning and design for 6 lanes is underway and could involve the reconstruction of intersections only.
- Widen Wonderland Road to six lanes through the corridor. The widening would be completed in phases, starting as early as 2023, subject to Council approval.

WHAT OPTIONS ARE BEING DEVELOPED?

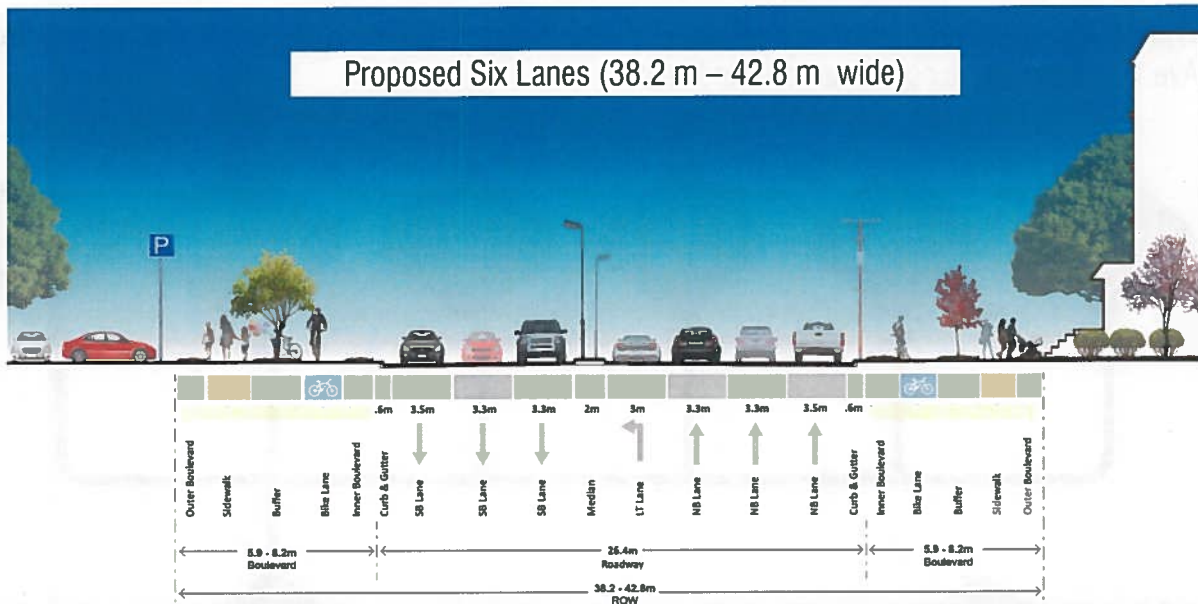
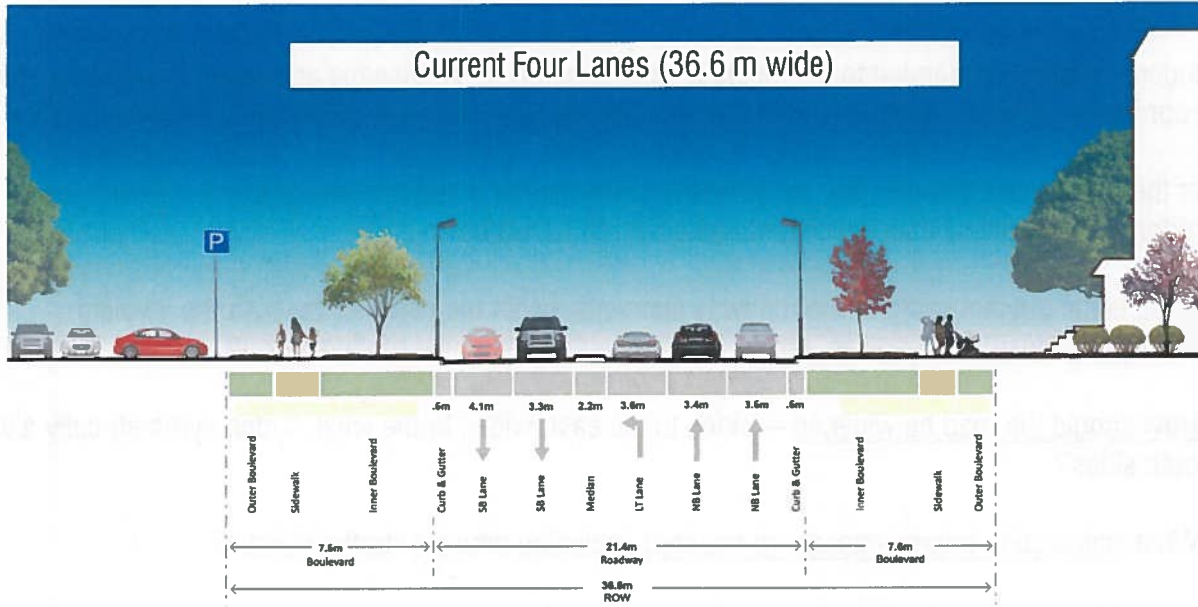
Wonderland Road is intended to be built to a high standard of streetscape and urban design throughout the corridor.

Over the next several months, the study team will develop and evaluate designs for six-laning the corridor. The options will be developed and analyzed based on:

- What is the optimal width of the roadway elements within the corridor (lane widths, cycling facilities, pedestrian amenities, utility requirements, trees, noise barriers, etc.)?
- How should the road be widened – widen to the east, widen to the west, widen symmetrically along both sides?
- What intersection improvements are required, including timing of traffic signals?
- How should existing drainage issues along the corridor be addressed?
- What unique elements should be planned for the main street section (CNR structure to Beaverbrook Ave.) to support the pedestrian-oriented area?



WHAT WOULD SIX-LANES ON WONDERLAND LOOK LIKE? SOUTHDALE ROAD TO COMMISSIONERS ROAD



- In-boulevard bike lanes recommended throughout corridor.



Artistic depiction of six-lanes – Looking North from Southdale Road

Next Steps

1

Review comments provided at and following this event

2

Develop design options along the corridor

3

Evaluate options and select a recommended design

4

Public Information Centre #2 (anticipate late 2019)

5

Environmental Study Report available for 30-day public review period



THANK YOU

The input of the Cycling Advisory Committee is important to the outcome of this project. Please provide comments, attending PICs and ask questions throughout the study!



Key Contacts

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Transportation Design
Engineer
City of London
519.661.CITY (2489) x 5806

Getinvolved.london.ca



THAMES VALLEY CORRIDOR SoHo Neighbourhood



JANUARY 16, 2018
Cycling Advisory Committee Meeting



INTRODUCTION Purpose

Generate a Long-term Concept Plan and Short-term detailed design (associated with Phase 1 implementation) for the Thames Valley Corridor (TVC) on the north side of the Thames River between Wellington Street and Maitland Street, within the Old Victoria Hospital Lands (OVHL).



INTRODUCTION Purpose

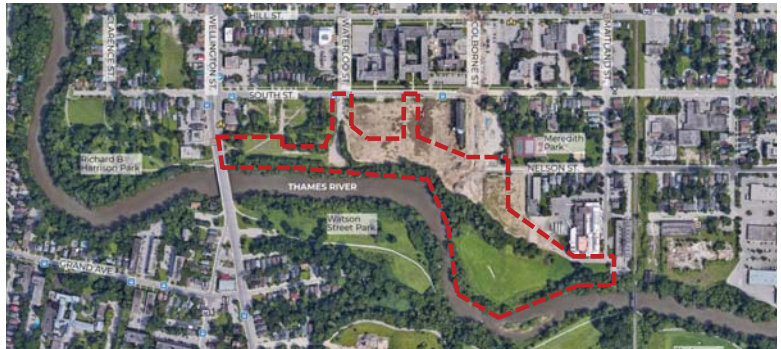
The concept plan and subsequent detailed design developed from this study will:

- Create Gathering Spaces along the top of the Thames Valley Corridor within a new Urban Park Setting;
- Establish Park Amenities for District Park;
- Provide Opportunities for Views to the Thames River and Other Important Site Features;
- Improve Pedestrian Circulation and Linkages to Adjacent City Parks and the Thames Valley Parkway;
- Provide a New Local Shared Pedestrian Driveway along the top of the TVC;
- Integrate the Ecological Recommendations identified in the Environmental Impact Study.



INTRODUCTION Site Context

The site is generally bound by Wellington Street to the west, South Street to the north, Maitland and Colborne Street to the east and the South Branch of the Thames River to the South.

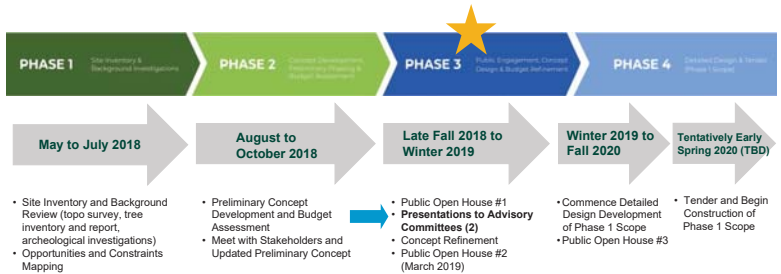


INTRODUCTION Project Background

- This project is a key component of the redevelopment of the Old Victoria Hospital Lands (OVHL).
- Offers a strategic opportunity to respond proactively to the London Plan by providing significant public open space within the Thames River Valley system.
- Opportunity to showcase Environmental Stewardship, Contextual Sensitivity, Habitat Restoration and Woodland Restoration and Management, New Park Opportunities and Historic Commemoration.



INTRODUCTION Study Outline



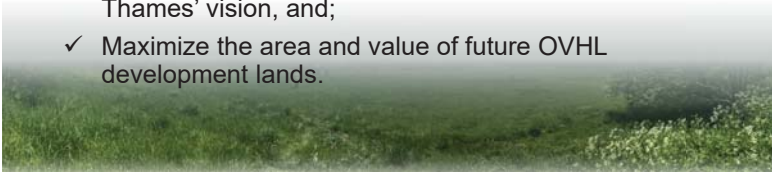


INTRODUCTION

Key Project Goals / Objectives

The concept plan and subsequent detailed design developed from this study will:

- ✓ Support the goals and objectives of the SoHo Community Improvement Plan;
- ✓ Be consistent with London Official Plan policies detailed in the Old Victoria Hospital Lands (OVHL) Secondary Plan;
- ✓ Will take into consideration the 'Ribbon of the Thames' vision, and;
- ✓ Maximize the area and value of future OVHL development lands.



INTRODUCTION

Key Project Goals / Objectives

The concept plan will:

- ✓ Apply AODA standards and Crime Prevention Through Environmental Design (CPTED) principles;
- ✓ Use best practices for ALL circulation (vehicular, pedestrian/cycling);
- ✓ Incorporate and enhance existing natural features;
- ✓ Establish connections of spaces within the park and to the surrounding community.



CYCLING CONTEXT

Wellington Road is identified as a Rapid Transit Corridor.

The concept plan will support the recommendations identified in the City of London Cycling Master Plan (2016).



CYCLING CONTEXT

Nelson Street is a signed east-west bicycle route



CYCLING CONTEXT

Colborne Street has bicycle lanes



CYCLING CONTEXT

TVP continues to the west with connections to Harris Park





BACKGROUND STUDIES

Background Studies which will influence the Design Process:

- Geotechnical Reports which established the long term stable slope and erosion access allowance;
- Record of Site Condition which identifies past uses and contamination surveys;
- Environmental Impact Study which provided recommendations for woodland buffers and other relevant setback limits
- Archeological – Stage 1



BACKGROUND STUDIES Opportunities & Constraints Mapping



• The draft concept plan is informed by the work that was done in Stage 1.

• It illustrates the overall strategy for the six unique design elements to be incorporated and how they are linked and mutually supported.

• It conceptually illustrates the long-term and short term implementation strategy based on current approved budgets.



Preferred Long-Term Concept

- 1. Thames Valley Parkway**
 - 3.0m wide multi-use pathway
- 2. Urban Park Corridor**
 - Formal pedestrian gathering space with attractive amenities
- 3. Woodland Enhancements**
 - Enhancements to the existing woodland and floodplain per the EIS
- 4. Shared Pedestrian/Vehicular Drive**
 - 9.0m wide shared corridor between Waterloo St. and Colborne Street, which is a flexible space
- 5. Mid-block Connection**
 - 12m Wide Right of Way (two-way) public municipal road with access to the Phase 1 development
- 6. District Park**
 - Low key connection to the Thames River suitable for paddling launch
 - Support a natural playground with walking trails, meadow planting and open space for picnicking



Preferred Long-Term Concept



Preferred Long-Term Concept



Urban Promenade Gathering Areas



C Urban Promenade - Adjacent to TVP



Urban Promenade & Shared Driveway



D Central Urban Plaza



Central Urban Plaza



E Mid-Block Connection



Mid-Block Connection



Preferred Long-Term Concept



District Park

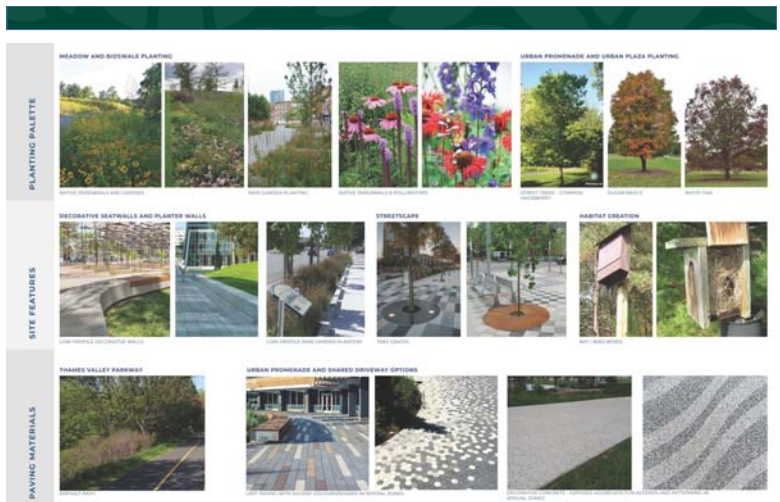
- 3.0m wide multi-use asphalt pathway
- Fully accessible, integrated walkway and cycling system with gathering areas along the Thames Valley Corridor
- Incorporate a hierarchy of trail and directional signage
- Provide primary and secondary walkways with internal linkages
- Provide storage for bicycles (bike racks)
- Incorporate lighting along the Thames Valley Parkway and throughout the corridor
- Incorporate CPTED principles and AODA standards



Active Transportation Design Features



Materials Palette



Materials Palette



PUBLIC ENGAGEMENT Summary to Date



PUBLIC ENGAGEMENT What We Heard

- ✓ Environmental and Naturalization Opportunities are Very Important (ie. rain gardens, naturalized areas, habitat creation, pollinator habitats, LID's).
- ✓ Opportunities for Various Gardens (incorporating flora, fruit trees, community gardens).



PUBLIC ENGAGEMENT What We Heard

- ✓ Preference for Passive Recreation over Active Recreation with Amenity Space (open space, areas for picnicking, gathering/events, cycling/walking, canoe or paddle launch, playground)
- ✓ Celebrate the Cultural and Heritage Uniqueness of the Site (interpretive signage/storyboards, public art, etc.).





Update on Bike Share Activities and Development of a Business Case



Jay Stanford
Director, Environment, Fleet & Solid Waste

Allison Miller
TDM Coordinator

January 16, 2019



What is Bike Share?

- A transportation service where shared bicycles are available at a cost for short trips.
- Allows people to borrow a bike from one location and return it to another location.
- System is meant for one-way trips.
- Can be “pay-as-you-go” one-time users or regular users with discounted membership fees.
- Targets residents, students and visitors.



Past Interest in Bike Share in London

- At least 3 different concepts have been discussed in London in the last 7 years
- Minimal research undertaken to support concepts
- More discussion occurred with growth in systems across North America
- In summary . . . growing interest in London



Why is City Undertaking Study?

Answers are needed to develop a Business Case . . . completed projects with community engagement have listed the potential for bike share:

- 2013 Smart Moves Transportation Master Plan
- 2015 Our Move Forward: London’s Downtown Plan
- 2016 Cycling Master Plan
- The London Plan
- 2017 Downtown Parking Strategy



What is Bike Share?

Used for trips:

- to/from work
- work-related
- to/from school
- errands
- recreation



System Types

Docked

- use of “docks”: special bike racks for holding the bike
- release bike by payment through a payment kiosk or smartphone app
- user must return bike to a dock, locking it in place

Dockless

- bikes are locked anywhere (no designated docks)
- bikes are located and unlocked using a smartphone app

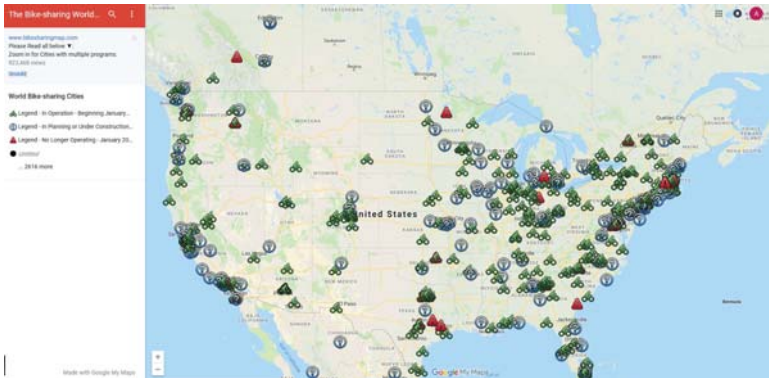
Hybrid (havens)

- use a combination of docks and designated areas for bike parking
- bikes have built-in locks



Bike Share Systems

As of January 2019: 18 in Canada, over 80 in the US and over 2,000 around the world



Business Case: Scope

- Completing a business case to help decision-makers determine if bike share makes sense for London.
- Project scope includes four main areas:
 - Review existing bike share systems in operation in North America
 - Conduct a market analysis of existing cycling use and potential uptake in London
 - Seek input from the public
 - Provide a high level summary implementation plan
- Depending on decision, develop an RFP
- Scope does not include electric kick scooters



Business Case: Process

Working with Consultant Team

City staff + IBI Group + FourSquare ITP

- Active Transportation planning expertise
- Bike share planning expertise
- Bike share user experience

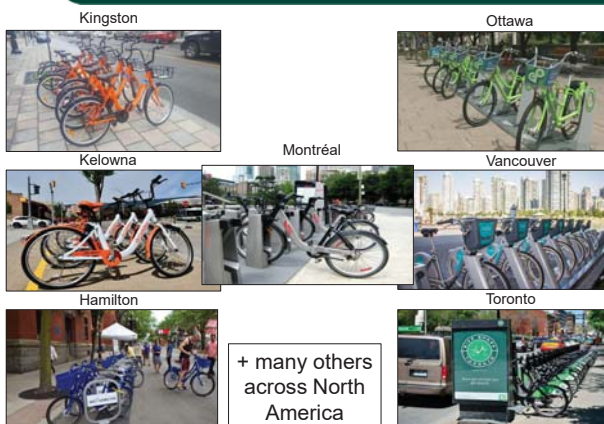


Business Case: Understanding Systems

- Visits to systems throughout North America
- Project site visits with Toronto Bikeshare Service and SoBi in Hamilton
- Informal meetings and research with suppliers



Business Case: Peer Review Examples



Business Case: Draft Guiding Principles

1: Financial Sustainability	Create a system that is financially sustainable, transparently operated, and accountable.
2: Mobility and Access	Increase the ability of Londoners to access their daily needs via the current and ever-growing cycling network.
3: Environment and Health	Address the effects of personal transportation on climate change by providing a new option for getting around London.
4: Community Building	Leverage the bike share system and accompanying cycling usage as a tool to promote livability, and attract or retain residents, businesses and visitors.



Business Case: Understanding London

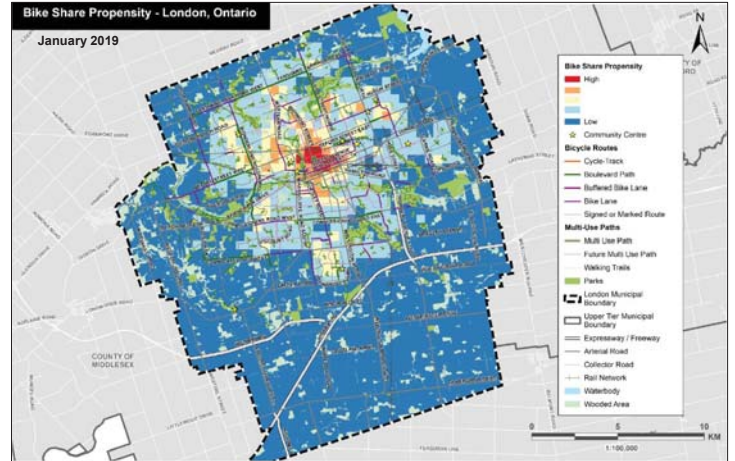
Existing Conditions Mapping:

- Population age
- Population density
- Existing cycling infrastructure
- Existing and future transit routes and stops
- Car share locations
- Key destinations
- Main streets

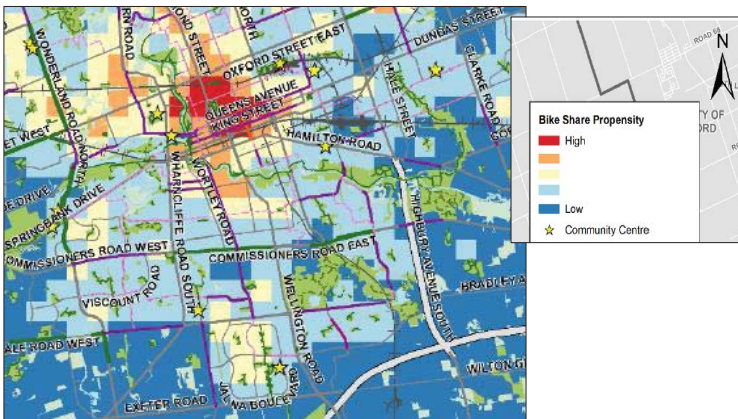
Propensity Analysis: areas most likely to use bike share



What We've Learned (so far)



What We've Learned (so far)



Community Engagement



Community Engagement

Requesting Preliminary Feedback

- **General** - Have you used a bike share before? Where? Your experience?
- **London** - How often would you use it? When would you use it? Where would you use it?
- **Thoughts** - on Guiding Principles



Next Steps

- Complete background and market research
- Prepare Business Case
- Further engagement
- Present Business Case to Committee/Council - Spring 2019



East-West Bikeway Evaluation



Cycling Advisory Committee – January 16, 2019



Meeting Objectives

- Identify the preferred alternative for the east-west bikeway evaluation
- Identify the top three ranked corridors
- Next steps for east-west bikeway

2



Background

- Six corridors alternatives were evaluated as part of the East-West Bikeway Evaluation:
 - Dufferin Avenue
 - York Street
 - King Street and Queens Avenue couplet
 - Dundas Street – two-way unidirectional
 - Dundas Street OEV Hybrid
 - Dundas Street – two-way bidirectional

3



Dufferin



York



King & Queens Couplet



4



Dundas (two-way unidirectional and bidirectional)



Dundas & Queens Hybrid OEV Couplet



5



Study Evaluation Criteria

- These criteria were developed using best practices from Ontario Traffic Manual (OTM) Book 18: Cycling Facilities and with input from key stakeholders



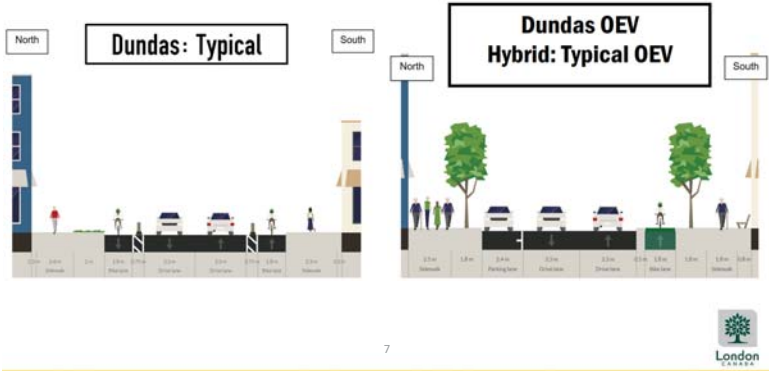
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Dundas Street Alternatives

- Preferred Alternative – Dundas OEV Hybrid

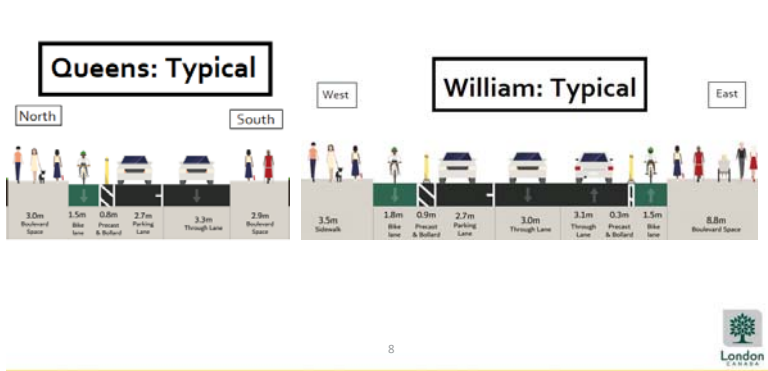


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Dundas Street Alternatives

- Preferred Alternative – Dundas OEV Hybrid



8



Enhancing the Pedestrian and Public Realm



New street features enhance the public realm and vitality of the OEV.

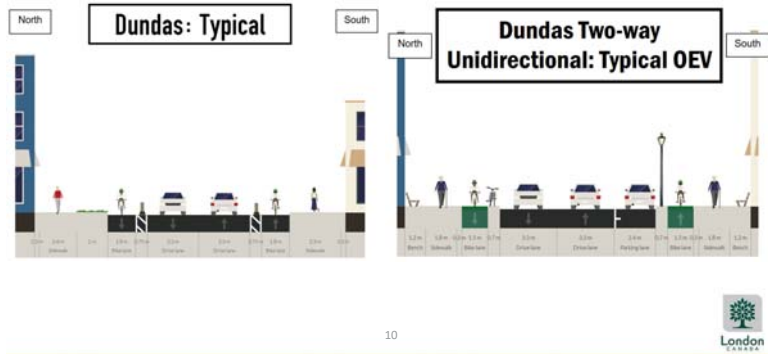
- Landscaping zones to beautify the street
- Patio space for local businesses
- Mid-block crossings for easier pedestrian movement
- Separated bikeway for eastbound cyclists

9



Dundas Street Alternatives

- 2nd ranked alternative – two way unidirectional

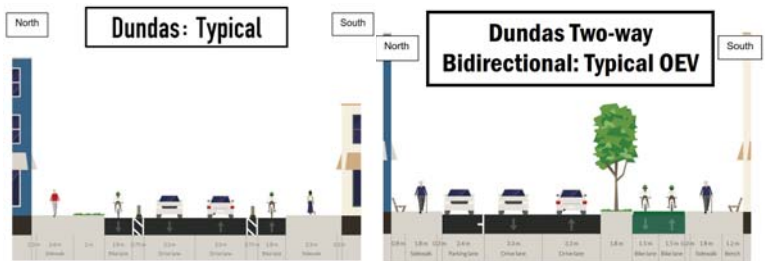


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Dundas Street Alternatives

- 3rd ranked alternative – two way bidirectional



11



Proposed Separation Techniques



12





Dundas & Colborne Protected Intersection



14



Next Steps

- Report to Council
- Begin design phase for east-west bikeway
- Construction quickly follows
- Continue to work with CAC throughout the design phase

- 1 rating – least preferred
- 4 rating – most preferred

Evaluation of Top 3 Ranked Alternatives

	1 Rating	2 Rating	3 Rating	4 Rating
1st Dundas OEV		<ul style="list-style-type: none"> • Conflict Mitigation • Parking • Traffic Operations 	<ul style="list-style-type: none"> • Constructability • Transit Operations • Connectivity & Directness • Destination Access • Cost • Social Health & Equity 	<ul style="list-style-type: none"> • Streetscape & Pedestrian Realm • Retail Economic Impact
2nd Dundas two-way uni		<ul style="list-style-type: none"> • Conflict Mitigation • Parking • Traffic Operations • Streetscape & Public Realm • Retail Economic Impact 	<ul style="list-style-type: none"> • Constructability • Transit Operations • Cost 	<ul style="list-style-type: none"> • Connectivity & Directness • Destination Access • Social Health & Equity
3rd Dundas two-way bi	<ul style="list-style-type: none"> • Conflict Mitigation • Traffic Operations 	<ul style="list-style-type: none"> • Constructability • Parking • Transit Operations • Streetscape & Pedestrian Realm • Cost • Retail Economic Impact 		<ul style="list-style-type: none"> • Connectivity & Directness • Destination Access • Social Health & Equity



Questions?

16



Dear chair and fellow members of the Civic Works Committee,

That we might begin the dialogue about transportation in a timely fashion I would like to bring forth the following motion:

That staff provide, at the first opportunity, a report indicating which transportation projects are most likely to receive funding from the provincial and federal governments.

Michael van Holst

DEFERRED MATTERS

**CIVIC WORKS COMMITTEE
(as of January 28, 2019)**

Item No.	File No.	Subject	Request Date	Requested/ Expected Reply Date	Person Responsible	Status
1.	75.	<p><u>Options for Increased Recycling in the Downtown Core</u> That, on the recommendation of the Director, Environment, Fleet and Solid Waste, the following actions be taken with respect to the options for increased recycling in the Downtown core:</p> <p>b) the Civic Administration BE DIRECTED to report back to the Civic Works Committee in May 2017 with respect to:</p> <ul style="list-style-type: none"> i) the outcome of the discussions with Downtown London, the London Downtown Business Association and the Old East Village Business Improvement Area; ii) potential funding opportunities as part of upcoming provincial legislation and regulations, service fees, direct business contributions, that could be used to lower recycling program costs in the Downtown core; iii) the future role of municipal governments with respect to recycling services in Downtown and Business Areas; and, iv) the recommended approach for increasing recycling in the Downtown area. 	Dec 12/16	1 st Quarter 2019	K. Scherr J. Stanford	
2.	76.	<p><u>Rapid Transit Corridor Traffic Flow</u> That the Civic Administration BE DIRECTED to report back on the feasibility of implementing specific pick-up and drop-off times for services, such as deliveries and curbside pick-up of recycling and waste collection to local businesses in the downtown area and in particular, along the proposed rapid transit corridors.</p>	Dec 12/16	2nd Quarter 2019	K. Scherr J. Ramsay	

3.	78.	<p><u>Garbage and Recycling Collection and Next Steps</u> That, on the recommendation of the Managing Director, Environmental and Engineering Services and City Engineer, with the support of the Director, Environment, Fleet and Solid Waste, the following actions be taken with respect to the garbage and recycling collection and next steps: b) the Civic Administration BE DIRECTED to report back to Civic Works Committee by December 2017 with: i) a Business Case including a detailed feasibility study of options and potential next steps to change the City's fleet of garbage packers from diesel to compressed natural gas (CNG); and, ii) an Options Report for the introduction of a semi or fully automated garbage collection system including considerations for customers and operational impacts.</p>	Jan 10/17	2 nd Quarter 2019	K. Scherr J. Stanford	2 nd Quarter 2019
4.	91.	<p><u>Warranted Sidewalk Program</u> That the following actions be taken with respect to the Warranted Sidewalk Program: a) the Managing Director, Environmental and Engineering Services and City Engineer BE REQUESTED to develop an improved community engagement strategy with respect to Warranted Sidewalk Program; and, b) the Managing Director, Environmental and Engineering Services and City Engineer, BE REQUESTED to report back to the Civic Works Committee with respect to the potential future provision of additional sidewalk installation options on the east side of Regal Drive in the Hillcrest Public School area; it being noted that currently planned work would not be impeded by the potential additional work; it being further noted that the Civic Works Committee received a delegation and communication dated September 22, 2017 from L. and F. Conley and the attached presentation from the Division Manager, Transportation Planning and Design, with respect to this matter.</p>	Sept 26/17	2 nd Quarter 2019	D. MacRae	
5.	93.	<p><u>Public Notification Policy for Construction Projects</u> That the Civic Administration BE DIRECTED to amend the "Public Notification Policy for Construction Projects" to provide for a notification process that would ensure that property owners would be given at least one week's written notice of the City of London's intent to undertake maintenance activities on the City boulevard adjacent to their property; it being noted that a communication from Councillor V. Ridley was received with respect to this matter.</p>	Nov 21/17	1 st Quarter 2019	U. DeCandido	

6.	94.	<p><u>Report on Private Works Impacting the Transportation Network</u></p> <p>b) report back to the Civic Works Committee, by the end of March 2018, on:</p> <p>i) ways to improve communication with affected business, organizations and residents about the timing, duration and impacts of permits for approved works, including unexpected developments;</p> <p>ii) ways to improve the scheduling and coordination of private and public projects affecting roadways and sidewalks that carry significant pedestrian, cyclist, transit and auto traffic;</p> <p>iii) resources required to implement these improvements; and</p> <p>iv) any other improvements identified through the review resources required to implement these improvements; and</p>	Dec 4/17	3rd Quarter 2018	G. Kotsifas	George to provide new date
7.	99.	<p><u>Pedestrian Sidewalk – Pack Road and Colonel Talbot Road</u></p> <p>That the communication from J. Burns related to a request for a pedestrian crosswalk at the intersection of Pack Road and Colonel Talbot Road BE REFERRED to the Division Manager, Transportation Planning and Design for review and consultation with Mr. Burns as well as a report back to the appropriate standing committee related to this matter.</p>	Feb. 6, 2018	2nd Quarter 2019	D. MacRae S. Maguire	
8.	104	<p><u>Toilets are Not Garbage Cans</u></p> <p>That the Civic Administration BE REQUESTED to undertake the following with respect to the "Toilets Are Not Garbage Cans" public awareness sticker initiative, coordinated by B. Orr, Sewer Outreach and Control Inspector</p>	June 19, 2018	1st Quarter 2019	S. Mathers	
9.	105	<p><u>Environmental Assessment</u></p> <p>That the Managing Director, Environmental and Engineering Services & City Engineer BE REQUESTED to report on the outstanding items that are not addressed during the Environmental Assessment response be followed up through the detailed design phase in its report to the Civic Works Committee.</p>	July 25, 2018	1st Quarter 2019	S. Mathers P. Yeoman	

December 19, 2018

Civics Works Committee!

You have my permission to share this letter in the City public record.

I request that this letter be added to the agenda for the Civics Works Committee meeting that is to be held on February 5, 2019. Since this letter pertains to the City's new plans to begin a Green Bin Program, I would also request that this letter be added to the working files in all City departments responsible for this program.

On October 3, 2018, I was in attendance at the Civics Works Committee where the Waste Diversion Action Plan was approved to move forward to become a part of London's evolving culture. The portion of this plan that concerns me the most is the Green Bin Program! As a community environmental activist, I was more than delighted to learn that London is finally moving forward with a program that will (if instigated in a sustainable manner) bring many benefits to the London community. However, my confidence gained no momentum at the October 3rd meeting and I wish to address these concerns in this communication...

There are cities and communities around the world (and I believe our own Canadian city of Edmonton) that are making money off organic waste. Through various types of anaerobic digestive systems, organic waste is turned into natural gas and/or hydro-electricity! By creating energy systems of this nature, our landfill deposits are decreased, our energy supply becomes sustainable and our carbon footprint is significantly decreased.

I was shocked that I was the only one present at the October 3rd CWC meeting to speak about these systems that exist in other cities and communities around the world! This is not new technology! This is not a new way of processing organic waste material! This is not a new way of creating sustainable energy!

I am also rather displeased with the fact that London's WDAP was not initiated before this time! I would love to believe that I live in a city that has inspirational objectives to create a healthier and happier city for all, but as the WDAP shows, many of London's plans are re-actionary instead of being actionary! The WDAP exists because of Provincial legislation, not because our city departments are overflowing with inspirationally motivated individuals concerned for our united future! I believe that it is now time for the City of London to begin looking for and working with true community leaders, planners and developers! Our city has so much potential, because of its relatively small size, to retro-fit, redesign, reshape and remold its landscapes and all developments, to become a world leader in so many areas of significance

The success of a sustainable Green Bin Program will need all City departments to re-evaluate their priorities. In just the last two years, we've seen a \$50 million dollar community complex built on Southdale Road, another massive complex (I'd estimate at around \$25 million dollars) in the west end of the City along Wavell Road, a \$2.8 million dollar heated pool installed in Byron as well as miles of useless sidewalks built along the most western reaches of Oxford Street! If projects of these natures continue to pull the needed funding away from the Green Bin Program,

London residents will indeed be put in a position where a raise in property tax will be the only option available to secure the needed funding for this program. The City needs to re-evaluate budget plans and put the Green Bin Program into the forefront of the **needs** of residents! It's that simple!!

I find it interesting that I am probably the most excited person in London to think about a future Green Bin Program... while at the same time, the most concerned person about how this program will be created and how this will impact residents for many years to come!

Let's do this, London! But let's do this right! Let's do this sustainably!!

Jim Kogelheide

From: van Holst, Michael

Sent: Monday, February 04, 2019 8:38 AM

To: CWC <cwc@london.ca>

Cc: Holder, Ed <edholder@london.ca>; Meagher, Michael <mmeagher@london.ca>; Lewis, Shawn <slewis@london.ca>; Pelozo, Elizabeth <epeloz@london.ca>; Lehman, Steve <slehman@london.ca>; Squire, Phil <psquire@london.ca>

Subject: Added CWC Motion - London Hydro Invitation

Dear Chair and fellow CWC members,

On October 16th of 2018, city council passed the following motion.

That London Hydro be requested to provide to the shareholder, London City Council, a breakdown of the estimated costs London Hydro will absorb for the work required to be undertaken for the bus rapid transit project; and further, if those costs will impact London Hydro ratepayers.

I therefore move that:

That the CEO of London Hydro be invited to the March 4th meeting of the SPPC to provide the information requested by Council on October 16th 2018. It being noted that the estimates will be based on a BRT plan that has not yet been finalized.

Sincerely,

Michael van Holst