



**STAFF REPORT
ACTION REQUIRED**

**Source Water Protection Plan for City of Toronto Water
Treatment Plants: Update**

Date:	July 28, 2014
To:	Public Works and Infrastructure Committee
From:	General Manager, Toronto Water Executive Director, Engineering and Construction Services
Wards:	All Wards
Reference Number:	P:/2014/Cluster B/TW/pw14012

SUMMARY

The purpose of this report is to provide an update to City Council about the status of the Credit Valley, Toronto and Region, Central Ontario (CTC) Source Water Protection Plan, and to request Council to reiterate its endorsement of the policies in the Plan and Council's contention that the Ministry of the Environment and Climate Change, and not the City or other municipalities, is the appropriate body for implementing the Lake Ontario policies contained in the CTC Source Water Protection Plan.

The CTC Source Water Protection Plan was developed to address drinking water threats to water treatment plant intakes in Lake Ontario. The Plan contains policies that, once adopted, are intended to protect the near shore of Lake Ontario, which is the source of drinking water for approximately 6 million people in the Golden Horseshoe area. The policies were developed, recognizing that pollution inputs once released to Lake Ontario do not respect municipal or Source Protection Region boundaries and that it is appropriate for the Ontario Government to take responsibility for implementation.

While the CTC Source Water Protection Plan was filed for final approval with the Minister of the Environment on October 22, 2012, the CTC Source Protection Committee only recently received a written response from the Ontario Ministry of the Environment and Climate Change seeking removal or significant amendments to the Lake Ontario policies prior to approving the CTC Source Water Protection Plan. The CTC Source Protection Committee concluded that accepting the amendments would diminish the effectiveness of the Plan and, as a result, chose to maintain the Lake Ontario policies as originally submitted as part of the Plan at its meeting of June 24, 2014.

RECOMMENDATIONS

The General Manager, Toronto Water, and Executive Director, Engineering and Construction Services recommend that:

1. City Council confirm, to the Ontario Minister of the Environment and Climate Change, its endorsement of the Lake Ontario policies, intended to protect the drinking water source for the City of Toronto, Region of Peel, and the Region of Durham, and contained in the Credit Valley, Toronto and Region, Central Ontario (CTC) Source Water Protection Plan submitted to the Ontario Minister of the Environment on October 22, 2012, and updated at the CTC Source Protection Committee meeting of June 24, 2014 (found at: <http://www.ctcswp.ca/ctc-source-protection-plan>);
2. City Council request the City Manager to write to the Deputy Minister of Environment and Climate Change, strongly indicating that the Ontario Ministry has a duty to protect and enhance the near shore water quality of Lake Ontario; and to request that the Ontario Ministry acknowledge its responsibility as the “Implementing Body” for the purpose of the Lake Ontario policies contained in the CTC Source Water Protection Plan;
3. City Council forward a copy of this report to municipalities located along the north shore of Lake Ontario and which operate water treatment facilities that rely on Lake Ontario for their source water and encourage them to communicate their support for the Recommendations in this report, particularly Recommendation 2, to the Ministry of the Environment and Climate Change; and
4. City Council direct the General Manager, Toronto Water, to report to the Public Works and Infrastructure Committee when a formal response on the approval of the CTC Source Water Protection Plan, and the Lake Ontario Policies contained in the Plan, has been received from the Minister of the Environment and Climate Change.

Financial Impact

There is no financial impact associated with this report.

The Deputy City Manager and Chief Financial Officer reviewed this report and agrees with the financial impact statement.

DECISION HISTORY

City Council, at its meeting of September 26 and 27, 2007, authorized the Deputy City Manager responsible for Toronto Water, in consultation with the General Manager of Toronto Water, to designate Toronto’s two representatives on the Credit Valley, Toronto and Region, Central Ontario (CTC) Source Protection Committee. A copy of the Council Decision Document can be found at: <http://www.toronto.ca/legdocs/mmis/2007/cc/decisions/2007-09-26-cc12-dd.pdf>

At its meeting of November 27, 28, and 29, 2012, City Council unanimously endorsed the Source Water Protection Plan developed by the Credit Valley, Toronto and Region, Central Ontario (CTC) Source Protection Committee. The Plan presents policies intended to reduce threats to the sources of drinking water, including Lake Ontario, the source of drinking water for the 2.8 million residents of Toronto. A copy of the Council decision can be found at: <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2012.PW19.6>

ISSUE BACKGROUND

Economic, Environmental, and Social Value of Lake Ontario

Every day, 6 million Ontario residents representing almost half of the province's population, including those in the City of Toronto, rely on Lake Ontario as a safe and abundant source of drinking water. Further, Lake Ontario provides a wide range of other benefits, from recreational opportunities such as swimming and fishing, to power generation and transportation for people and industries. In order to sustain Ontario's economic, social, and environmental prosperity, it is imperative to protect and improve the water quality of Lake Ontario and its tributaries.

Ontario *Clean Water Act* and Source Water Protection

In 2006, in recognition of the importance of protecting the sources of drinking water for all Ontarians, the Ontario government passed the *Clean Water Act (2006)* [S.O. 2006, Chapter 22]. This Act addresses recommendations made by Justice O'Connor in his judicial inquiry into the tainted water tragedy that occurred at Walkerton in 2001.

The Act established Source Water Protection Regions, including the Credit Valley, Toronto and Region, Central Ontario (CTC) Source Protection Committee, with responsibility for developing a Source Water Protection Plan to address activities and land uses around municipal wells (groundwater sources) and drinking water treatment plant intakes (surface water sources – including Lake Ontario) to protect existing and future sources of drinking water.

In accordance with the 2007 Council Decision, the Associate Medical Officer of Health and the Director, Water Infrastructure Management (currently the Executive Director, Engineering & Construction Services) were officially named as the City of Toronto representatives on the CTC Source Protection Committee.

The CTC Source Protection Committee examined a total of 21 threats to the safety of Lake Ontario drinking water. The threats were evaluated using computer simulation modelling, which showed the following scenarios to be significant threats to one or more City of Toronto drinking water treatment plant intakes:

Table 1. Significant Threats to City of Toronto Drinking Water Treatment Plant Intakes

Type of Threat	Scenario	Spill / Pollutant Release Location	Water Treatment Plant Intakes Threatened
Petroleum spill from a fuel storage tank farm	Fuel from a storage facility in Oakville spilling into Bronte Creek and spills from a tank farm located in Toronto flowing into the Upper West Don River.	Bronte creek and Upper West Don River	ALL
Petroleum spill from a pipeline failure	Based on the real-life rupture of a 750 mm diameter pipeline near Kalamazoo, Michigan, in 2010. For the purpose of modelling the scenario for the City of Toronto, pipeline characteristics and product volumes for facilities located in the Greater Toronto Area were used to assess the impact of potential breaks at a number of river crossings.	Credit River	R.L. Clark WTP
		Don River	R.L. Clark, R.C. Harris and Island WTPs
		Duffin Creek	R.C. Harris and F.J. Horgan WTPs
		Highland Creek	R.C. Harris and F.J. Horgan WTPs
		Humber River	R.L. Clark, R.C. Harris and Island WTPs
		Rouge River	R.C. Harris and F.J. Horgan WTPs
Disinfection failure at a wastewater treatment plant	A two-day total disinfection failure was assumed at each of Toronto's wastewater treatment plants, plus the Duffin Creek Water Pollution Control Plant (WPCP) in the Region of Durham and the Lakeview Wastewater Treatment Plant in the Region of Peel.	Ashbridges Bay WWTP	R.L. Clark, R.C. Harris and F.J. Horgan WTPs
		Duffin Creek WPCP	R.C. Harris and F.J. Horgan WTPs
		Highland Creek WWTP	R.C. Harris and F.J. Horgan WTPs
		Humber WWTP	R.L. Clark, R.C. Harris and F.J. Horgan WTPs
		Lakeview WWTP	R.L. Clark and R. C. Harris WTPs
Streambank erosion leading to the failure of a sanitary trunk sewer	Spills were assessed for sanitary trunk sewers located in the valleys of the Humber and Don Rivers, and Etobicoke and Highland Creeks.	Don River	R.C. Harris WTP
		Etobicoke Creek	R.L. Clark WTP
		Highland Creek	F.J. Horgan WTP
		Humber River	R.L. Clark WTP

The evaluations shown in the above table provided the foundation for the policies contained in the CTC Source Water Protection Plan, which was filed for approval with the Minister of the Environment and Climate Change on October 22, 2012, and can be found at: (<http://www.ctcswp.ca/ctc-source-protection-plan>; see CTC Amended Proposed Source Protection Plan). Chapter 10.12 (page 128 of the Plan) presents the policies relevant to Lake Ontario based water treatment plant intakes.

For the most part, the Lake Ontario policies contained in the CTC Source Water Protection Plan identify the Ontario Government as the appropriate “Implementing Body” (i.e., the authority responsible to ensure the policy is implemented) for all Lake Ontario Source Protection Plan policies, and not the individual municipalities where a given threat may be located (e.g., pipeline, nuclear power plant, fuel storage facility, etc.) because:

- 1) Lake Ontario is an international water subject to treaties between Canada and the United States which are administered via the Canada-Ontario Agreement, which outlines how the governments of Canada and Ontario will cooperate and coordinate their efforts in order to meet Canada's obligations under the Canada-United States Great Lakes Water Quality Agreement (GLWQA);
- 2) Many of the threats identified in the Plan originate with activities and/or operations that are regulated by other, more senior levels of governments;
- 3) Pollutants entering Lake Ontario do not respect municipal boundaries. Without an ability to take inter-jurisdictional enforcement actions, individual municipalities

- cannot effectively mitigate threats originating beyond their borders; and,
- 4) The Ontario Government has powers and responsibilities under several other pieces of legislation, including the *Clean Water Act* (the Act), and already has systems in place, such as the Spills Action Centre, which are aimed at mitigating emergencies related to spills and drinking water hazards.

COMMENTS

Since submitting the CTC Source Water Protection Plan to the Ministry on October 22, 2012, additional technical studies were undertaken by the CTC Source Protection Committee. These studies identified the need to incorporate updates to the Plan to reflect recent understanding of groundwater regimes for well water supplies in the upper part of the Source Protection Area. The CTC Source Protection Committee considered updates to the policies in the Plan at its meeting of June 24, 2014. At the same meeting, the Committee considered comments received from the Ministry of the Environment (MOE) in a letter dated June 18, 2014. The letter presented a complete set of recommendations from the Ministry, which are summarized in Table 2.

Table 2. Summary of CTC SPP Lake Ontario Policies and MOE's (2014) Response.

CTC SPP Policy Category	Identifier	SPP Chapter 10 Page Reference	Overview Description	MOE Response June 18 2014
General	LO-G	pp. 129 –131	Applicable to all threats and relating to improved spills notification protocols, the installation of instrumentation to assess real time lake circulation and water chemistry, the further development and application of Lake Ontario circulation and water quality modelling, and public education and outreach, particularly with other agencies including United States government agencies.	MOE disagrees with Policies requiring MOE to undertake modelling and provide in-lake instrumentation to support forecasting direction of currents in event of a future spill
Nuclear Generating Stations	LO-NGS	p. 133	Pertaining to improved spills notification protocols.	None
Sewers	LO-SEW	pp.136 –138	Directed at wastewater treatment plant by-pass flows and potential disinfection failures, the failure of sanitary trunk sewers, spills from properties which could enter the municipal storm sewer system, and the need for pathogen risk assessments at water treatment plants.	Requested that LO-Sewer-3 be deleted and addressed by municipalities through Sewer Use Bylaws
Pipelines	LO-PIPE	pp. 140 –141	In regards to reducing the risk and/or impact of petroleum pipeline breaks.	Suggested clarifying language.
Petroleum Tank Farm Storage	LO-FUEL	pp 142 –143	Dealing with the adequacy of existing spills prevention/contingency plans.	Requested clarifying language for LO-FUEL-1 and removal of LO-FUEL-2

At its meeting of June 24, 2014, the CTC Source Protection Committee considered the comments received from the MOE, and while a few changes were incorporated, the intent of the Lake

Ontario Policies remained essentially unchanged from the original submission made to the Ontario Minister of the Environment on October 22, 2012.

The Public consultation on the policies of the amended proposed source protection plan has been initiated by the CTC Source Protection Committee (<http://www.ctcswp.ca/ctc-source-protection-plan>) pursuant to the Clean Water Act, 2006 and Ontario Regulation 287/07.

Need for the Ontario Ministry of the Environment and Climate Change to provide better spill forecasting

The General Lake Ontario policy, LO-G, contained in the CTC Source Water Protection Plan, recommends the Ministry enhance its spill forecasting capabilities so that operators of water treatment plants along the north shore of Lake Ontario can be provided with information about: (i) the flow path of the spill; (ii) when the spill is expected to arrive at a particular intake and the expected pollutant concentration, and (iii) how long the threat from the spill is expected to last.

The Ontario Ministry of the Environment and Climate Change already has in place the "Spills Action Centre", which handles reports of spills, adverse drinking water results and other urgent environmental concerns. According to the Ministry, the Spills Action Centre operates 24 hours a day, and Environmental Officers who receive the calls at the Spills Action Centre can provide advice and information related to spills or drinking water events.

Knowledge of whether a spill will be transported to an intake is an essential part of a Municipality's Emergency Planning to protect water treatment plant intakes, and knowledge of a significant spill to the Lake Ontario nearshore, which has the potential to impact water treatment plant intake water quality, is needed by all municipalities operating water treatment plants along the north shore of Lake Ontario, including those of the CTC Source Protection Area (the City of Toronto and the Regions of Peel and Durham). The Ontario Ministry of Environment and Climate Change is recommended as the lead agency to undertake these monitoring, modelling and reporting responsibilities, as it has staff with the necessary technical expertise and knowledge; has access to the required in-lake instrumentation; maintains computer simulation models necessary to make the forecasts; has the resources to track, in real time, the dispersion and flow path of the spill; and has the ability to notify affected municipalities of its monitoring results and forecasted predictions.

Need for the Ontario Ministry of the Environment and Climate Change to control spills to storm sewers that eventually discharge to Lake Ontario

Of the comments provided by the MOE, of particular concern are the recommendations to delete Policy LO-SEW-3 and Policy LO-FUEL-2.

Policy LO-SEW-3

The proposed Policy is as follows:

"Where a spill from a facility could reach an off-site storm sewer such that it would be a moderate or low drinking water threat as identified in the *Tables of Drinking Water Threats* (Ontario Regulation 287/07 under the *Clean Water Act*, 2006 in IPZ-2, IPZ-1), the Ministry of the Environment and Climate Change should enact the necessary legislation/regulation to require such facility owners to be subject to provincial approvals for spill prevention/mitigation plans."

Policy-LO-FUEL-2

The proposed Policy is as follows:

"Where event based modelling of a spill from a facility has shown that it could reach an of-site storm sewer such that it would be a significant drinking water threat (IPZ-3), the Ministry of the Environment should enact the necessary legislation/regulation to require such facility owners to be subject to provincial approvals for spill prevention/mitigation plans."

The above policies are aimed at situations where a facility with, for example, chemical storage but without an on-site storm sewer connection (i.e., no ability to force the implementation of spills prevention plans/controls via the City of Toronto's Sewers By-law) could have a spill from the facility enter a municipal storm sewer via a catchbasin (abutting the property) within the municipal right-of-way.

Both Policies seek to have the Ministry of the Environment and Climate Change require facility owners to take proper and appropriate spill prevention actions, so that spills that do occur and leave a site and enter a storm sewer that might eventually lead to the transport of the spilled material to Lake Ontario and hence to the City's water treatment plant intakes, are mitigated. In commenting on Policy LO-SEW-3, the Ministry's letter of June 18, 2014, states that "the responsibility for storm sewers rests with municipalities", and that "provincial legislation...which would duplicate municipal authorities is not practical." In commenting on Policy LO-FUEL-2, the Ministry, in its letter of June 18, 2014, asks the CTC Source Protection Committee to "Please consider removing this policy." The effect of the Ministry's response to Policy LO-SEW-3 is to download the responsibility to municipalities, and in the case of LO-FUEL-2, to dismiss the issue outright.

A chemical spill reaching a storm sewer would ultimately impact the Lake Ontario nearshore either through a direct storm sewer discharge to the lake, or from rivers flowing to the Lake, which receive storm sewer flows upstream. The MOE's response envisages each municipality with responsibility for storm sewers (within and outside of the CTC Source Protection Region), implementing and enforcing an equally restrictive storm sewer use by-law to address the issue. This is not an appropriate or practical approach, especially for two tiered municipalities, where storm sewer by-laws are typically within the jurisdiction of the lower tier municipality, and where the need for this type of by-law may not be given equal priority for all municipalities.

In consideration of the above, the CTC Source Protection Committee, at its meeting of June 24 2014, maintained these two Policies (Policy LO-SEW-3 and LO-FUEL-2) as originally drafted.

Importance of CTC Source Water Protection Plan policies has already been demonstrated

The importance of protecting sources of drinking water and the need to be proactive and put measures in place to prevent threats to drinking water sources, including Lake Ontario, was highlighted during the City's participation at the National Energy Board (NEB) hearing into Enbridge's Line 9B application, in Toronto on October 2013. Throughout the NEB process, and at the public hearing on the application, the City requested that the NEB require Enbridge to

have regard for and include applicable CTC policies in developing its own emergency procedures manual, plans and policies.

While Enbridge took the position that it was not bound by the proposed policies for a number of reasons it did commit, both in response to a City Information Request and in its Reply argument to the NEB, to further discussions with the City to determine how the CTC policies might be incorporated into Enbridge's Emergency Response Manual, plans, and policies. This outcome, although still at a preliminary stage, validates the Source Water Protection Plan as a framework for effective drinking water threat mitigation.

This staff report has been prepared in collaboration with staff from Toronto Public Health.

CONTACT

Bill Snodgrass, Ph.D. P.Eng.
Senior Engineer, Water Infrastructure Management
Toronto Water
Tel: (416) 392-9746
Fax: (416) 338-2828
E-mail: wsnodgr@toronto.ca

SIGNATURE

Lou Di Gironimo
General Manager, Toronto Water

Michael D'Andrea, M.E.Sc., P.Eng.
Executive Director,
Engineering and Construction Services
and
CTC Source Protection Committee Member