



CTC Source Protection Region



## Section 36 Workplan: CTC Source Protection Region

November 19, 2018

DRAFT for Toronto and Region Source Protection Authority Endorsement

## Executive Summary

Drinking Water Source Protection in Ontario is about safeguarding the quality and quantity of municipal sources of drinking water. Assessment reports outline vulnerabilities for quality and quantity, and identify threats around municipal drinking water systems. Source protection plans prescribe actions to reduce or eliminate identified threats. The CTC Source Protection Plan came into effect on December 31, 2015.

Section 36 under the *Clean Water Act, 2006* provides the provision to comprehensively review and update source protection plans, including assessment reports. Periodically updating these documents ensures that all municipal drinking water systems are protected, and changing biophysical and social conditions are captured in future planning for source protection. The CTC Source Protection Region was issued an order under Section 36 of the *Clean Water Act* by the Minister of the Environment and Climate Change in July 2015. The Order directed staff to consult with program partners to prepare and submit a workplan, to the Ministry by November 30, 2018.

This workplan outlines the work required over the next five years (April 2019 – December 2024) to update the source protection plan in accordance with Section 36. The objectives for this work are to address challenges to policy implementation, and review the science supporting the CTC Source Protection Plan. Table 1 summarizes the expected updates that will be required for the Source Protection Plan given extensive consultation with program partners, and knowledge of required technical work.

*Table 1 Expected Updates to the CTC Source Protection Plan and Timelines*

Update #	Description	Timeline
1	Consider update to DNAP-1 and DNAP-2 policies to include the addition of exception for small quantities.	April 2019 – March 2021
2	Review of agricultural source material policies (ASM-2, ASM-4) for gaps related to allowing a risk management plan (RMP) when a Nutrient Management Plan (NMP)/Strategy (NMS) is required, but has expired; or when a Nutrient Management Plan is voluntarily in place.	
3	Review of Policies ASM-1 and ASM-2: in particular duplication of requirements where NMP/NMS in place on a property where a risk management plan (RMP) is also required (i.e., soil testing).	
4	Review of the need for prohibiting the application of commercial fertilizer in Wellhead Protection Area-A.	
5	Consider changing implementation body in Lake Ontario policies.	
6	Consider addition to Policy LO-NGS-1 requiring that Ontario Power Generation designate an appropriate lead for source protection considerations.	
7	Consider the transportation of substances as a local threat. If deemed a local threat, create a specify action policy to address the this threat.	April 2020 – March 2022
8	Create policy to require signage at boundaries of most vulnerable areas (i.e., WHPA-A).	April 2019 – March 2021
9	Consider the creation of a policy or policies to address transport pathways.	
10	Consider the need for new source protection plan policies to prevent future drinking water threats.	April 2023 – March 2024

11	Re-evaluate the appropriateness of a risk management plan approach for all agricultural policies currently requiring prohibition outside of the WHPA-A.	April 2020 – March 2022
12	Review need for new policies as a result of adding liquid hydrocarbon pipelines as a prescribed threat.	April 2020 – March 2022
13	Review of 'Nitrate Issue' designation at Acton Drinking Water System based on additional water quality monitoring data and research results.	March – June 2024
14	Review of 'Chloride Issue' designation at Georgetown Drinking Water System based on additional water quality monitoring data.	
15	Review of 'Sodium and Chloride Issue' designations at Orangeville Drinking Water System based on additional water quality monitoring data.	
16	Group all significant groundwater recharge areas (SGRA) polygons previously scored 2,4,6 into one area with no score. Revision to map in each Assessment Report.	April 2019- March 2020
17	Update Assessment Reports to reflect the new prescribed significant threat per <i>Clean Water Act, 2006</i> (O. Reg. 287/07) - liquid hydrocarbon pipeline.	April 2020 – March 2022
18	Incorporation of climate change considerations based on direction from the Source Protection Programs Branch.	
19	Incorporate updated conceptual and groundwater model (Durham Region) results from numerical modeling into Water Budget Chapters.	January 2019- March 2021
20	Revise WHPA delineations for Uxville Drinking Water System as a result of model refinement and update.	
21	Incorporate updated modeling (Peel Region) results into Water Budget Chapters (including conceptual model update, groundwater model, surface water model, and modelling scenarios).	
22	Evaluate water quantity stress at subwatershed 13 and need for Tier 3 assessment.	
23	Revise WHPA delineations for Peel Region Drinking Water Systems as a result of model refinement and update.	
24	Incorporate updated water budget and stress assessment (Halton Region) results into Water Budget Chapter (including conceptual model update, groundwater model, surface water model, and modelling scenarios).	January 2020 – December 2023
25	Revise WHPA delineations for Georgetown and Acton Drinking Water Systems in Chapter 4 as a result of model refinement and update.	
26	Incorporate updated water budget and stress assessment (Orangeville) results into Water Budget Chapter (including conceptual model update, groundwater model, surface water model, and modelling scenarios).	September 2018 – March 2020
27	Revise WHPA delineations for Orangeville Drinking Water System in Chapter 4 as a result of model refinement and update.	
28	Identify new and existing transport pathways based on in-depth inventory in all three source protection areas.	April 2019 – March 2020
29	Updates to threat enumeration summaries.	April 2019- March 2024
30	Updates to content of Watershed Characterization Chapters.	
31	Assess effects of risk management measures on spill scenarios conducted through event-based modeling.	April 2021- March 2024
32	Consideration of additional modeling scenarios (i.e., spill from a ship, consideration of extreme weather events) for inclusion in CTC SPP.	



## Acknowledgments

The CTC Source Protection Region acknowledges the cooperation and support of municipal and conservation authority staff in the development of this workplan. The CTC Source Protection Committee and Amendments Working Group provided a great deal of assistance in reviewing and offering suggestions to improve the content of this workplan. Collaboration with and encouragement from the Source Protection Programs Branch has ensured that this workplan is complete and satisfies the content required for an Order to be issued by the Minister of Environment, Conservation, and Parks to update the CTC Source Protection Plan. Lastly, the coordination of this work could not have been completed without the ongoing financial support from the Government of Ontario.



## Acronyms

AR	Assessment Report
AWG	Amendments Working Group
CLOCA	Central Lake Ontario Conservation Authority
CLOSPA	Central Lake Ontario Source Protection Area
CTC	Credit Valley – Toronto and Region – Central Lake Ontario
CVC	Credit Valley Conservation
CVSPA	Credit Valley Source Protection Area
CWA	<i>Clean Water Act, 2006</i>
DWS	Drinking Water System
LOGG	Lake Ontario Collaborative Group
MECP	Ministry of the Environment, Conservation, and Parks
ODWS	Ontario Drinking Water Standard
SPC	Source Protection Committee
SPP	Source Protection Plan
SPR	Source Protection Region
TRCA	Toronto and Region Conservation Authority
TRSPA	Toronto and Region Source Protection Authority

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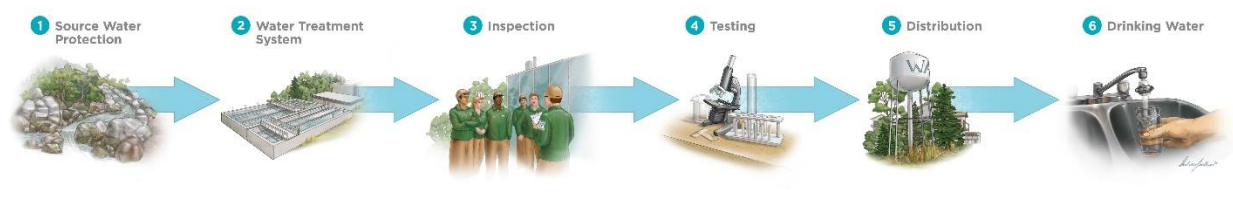
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## Background

The *Clean Water Act, 2006* was enacted as part of the response to recommendations from a public inquiry led by Justice Dennis O'Connor. The inquiry reviewed the events that culminated in a municipal drinking water well in Walkerton, Ontario being contaminated with *E. Coli* and *campylobacter* bacteria. Contaminated water continued to be distributed to the community through a series of human and mechanical failures in 2000 and resulted in seven deaths, and over 2,300 people falling ill, often with chronic effects. Following the Walkerton inquiry, Justice O'Connor made 121 recommendations on a wide range of areas related to protecting drinking water. These recommendations are the building blocks of Ontario's drinking water protection framework.

The Province of Ontario has created a comprehensive safety net from source to tap which puts in place a number of barriers to protect drinking water. The elements of this multi-barrier approach include strong legislation, stringent standards, regular and reliable testing, licensing of drinking water systems, regular inspections of drinking water systems and the laboratories that test drinking water, public reporting and the comprehensive source protection program. Source water protection is the first step in the multi-barrier approach to ensure safe drinking water is distributed in our communities (Figure 1).

Figure 1: Ontario's Multi-barrier Approach



Ontario's *Clean Water Act, 2006* and associated regulations aim to protect existing and future sources of drinking water as part of an overall commitment to safeguard human health and the environment. Sources of municipal drinking water are protected through a framework that encourages a watershed approach to collaboratively make evidence-based decisions. This process is meant to promote the shared responsibility of all stakeholders to protect local sources of drinking water from threats to both water quantity and water quality.

The *Clean Water Act, 2006* and *Regulation 284/07* created source protection regions and areas across Ontario, largely based on the watershed boundaries of Ontario's conservation authorities. There are 38 distinct source protection areas in the Province. Where appropriate, some of these source protection areas work collaboratively to create a source protection region. *Regulation 288/07* establishes the creation of local source protection committees in source protection regions and areas. These committees were responsible for the development of source protection plans and are tasked with evaluating the success of the policy implementation on an annual basis. All committees are required to have local municipal, economic, and public representation.

Assessment reports present detailed technical studies on vulnerable areas around and threats to municipal drinking water systems. These documents are expected to be updated and amended as new



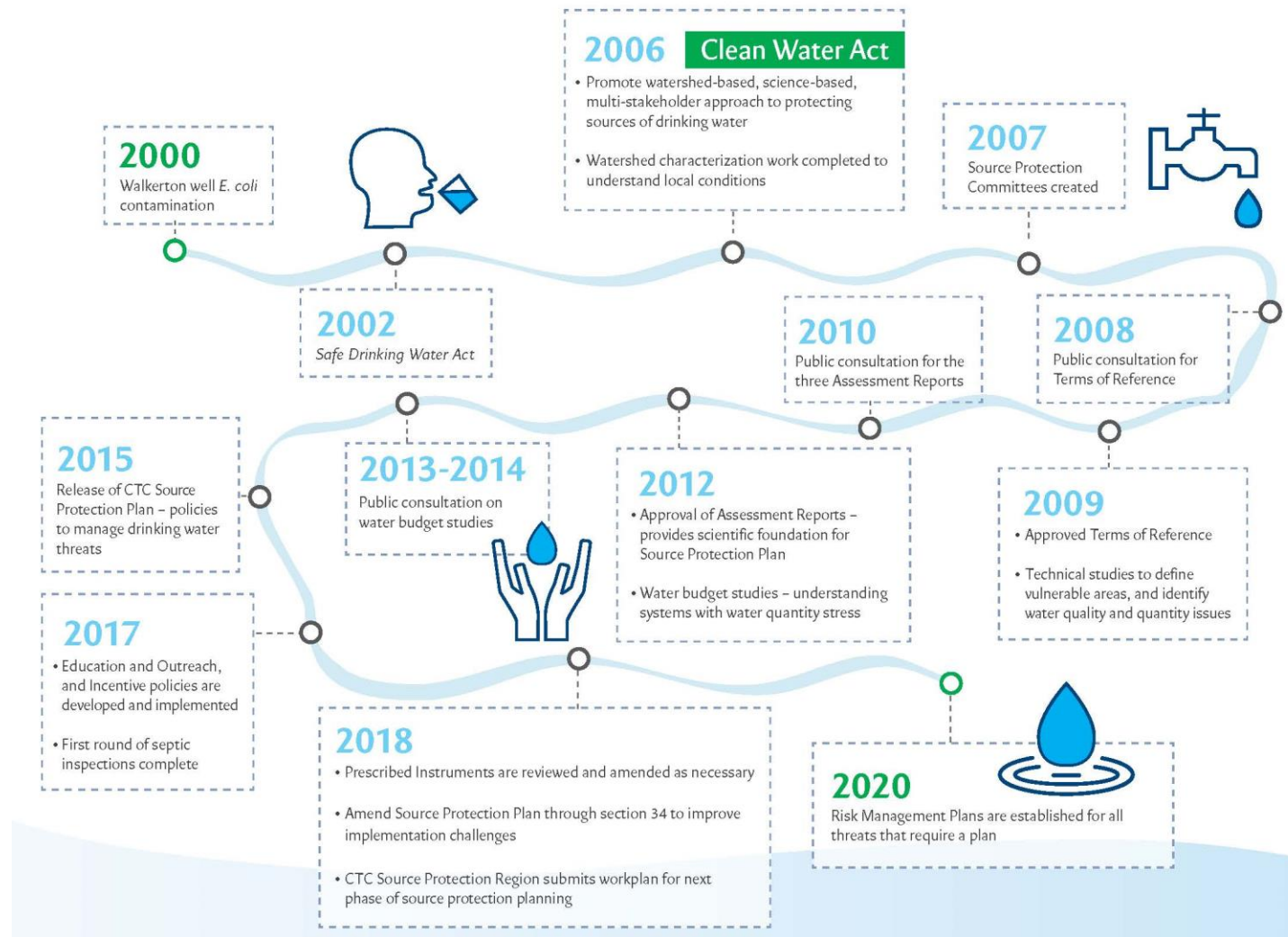
information becomes available or is necessary to reflect the current situation at each municipal drinking water system.

Source protection plans articulate the policies made to protect drinking water based on the findings in the assessment report(s). These documents were approved by the Minister of the Environment, Conservation, and Parks (formerly the Minister of the Environment and Climate Change). The CTC Source Protection Plan was written to achieve the objectives identified in the *General Regulation 287/07* under the *Clean Water Act, 2006*. These objectives are as follows:

- Protect existing and future drinking water sources; and
- Ensure that, for every vulnerable area identified in an Assessment Report where an activity is or would be a significant drinking water threat:
  - The activity never becomes a significant drinking water threat; and
  - If the activity is occurring when the Source Protection Plan takes effect, the activity ceases to be a significant drinking water threat.

Figure 2 outlines the timeline of source protection related work accomplished in the CTC Source Protection Region (SPR).

Figure 2: Timeline of Source Protection in the CTC Source Protection Region



## Introduction

At the time each of the source protection plans in the Province were approved, the Minister of the Environment, Conservation, and Parks (MECP), was required to issue an order to specify which parts of the source protection plan and assessment report were to be reviewed under section 36 of the *Clean Water Act, 2006*. MECP staff recognized that the review needed to be informed by the first years of implementation. With this in mind, the Minister's order put in place a requirement for a workplan, developed in consultation with the local source protection committee (SPC), source protection authorities (SPAs), municipalities, and the MECP, that will set out what aspects of the assessment report and source protection plan should be reviewed. Based on this workplan, the Minister may then issue another order specifying more detailed requirements governing the content and timeframes of this review. The correspondence (Appendix 1) from the Minister confirming approval of the CTC Source Protection Plan, written in July 2015, specified that a workplan under section 36 of the *Clean Water Act, 2006*, should be submitted by November 30, 2018.

### 1.1 Objectives

The objectives of this workplan have been based on the direction outlined in the Minister's letter confirming the approval of the CTC Source Protection Plan issued in July 2015.

- i) Propose the detailed steps for the review of the CTC Source Protection Plan;
- ii) Identify which portion of the CTC Source Protection Plan are to be reviewed;
- iii) The timelines for each step of the review;
- iv) The consultation that would be undertaken as part of the review; and
- v) Rationale for each step of the review.

### 1.2 Scope of Work

In December 2016, the Source Protection Programs Branch (SPPB) released guidance to assist source protection committees and authorities in directing the review of source protection plans and in preparing their workplan for submission to the Minister. The following factors were outlined as the foundation for this review:

- Results of environmental monitoring programs;
- Growth and infrastructure changes;
- Council resolutions;
- Policy effectiveness;
- Implementation challenges;
- Technical rule changes;
- Review of prohibition policies; and
- Local considerations.

Using the guidance released in December 2016, as well as supplemental direction issued in October 2017 (Municipal Engagement), March 2018 (Agricultural Prohibition), and August 2018 (Director's

Technical Rules), this Workplan outlines the review and proposed process to update the CTC Source Protection Plan.

### 1.3 Process Used to Review Source Protection Plan

The review of the CTC Source Protection Plan has been largely directed by an Amendments Working Group (AWG) created by the CTC Source Protection Committee in November 2016. This group has representation from all municipalities with municipal drinking water systems in the CTC Source Protection Region, five members of the CTC Source Protection Committee, and staff from all source protection authorities.

Given that the review of the assessment reports and source protection plan is intended to be an evidence-based process to recommend necessary updates to the CTC SPP, the CTC SPC felt it necessary to have municipalities (as key stakeholders in the Drinking Water Source Protection Program) as engaged in discussions pertaining to amending the source protection plan as possible. Appendix 2 documents participants on the Amendments Working Group.

With guidance from the AWG, direction was sought from the CTC SPC to advance workplan preparation. A description of how information was gathered for the workplan based on the content recommended in the December 2016 guidance from the Source Protection Programs Branch follows below (Table 2).

*Table 2: Approach to Review the Source Protection Plan*

Section 36 Review Content & Workplan Development	Approach
Results of Environmental Monitoring Programs	<p>CTC Source Protection Plan policies GEN-7 and SAL-9 were used to initiate dialogue with municipalities with drinking water systems where municipal groundwater monitoring has historically shown increasing or decreasing trends and / or exceedances of the Ontario Drinking Water Standards.</p> <p>SPA and municipal staff discussed results of environmental monitoring at other municipal drinking water systems in the CTC SPR during one-on-one consultation sessions held in November 2017.</p>
Growth and Infrastructure changes, Council Resolutions, Implementation Challenges	Discussions with municipalities responsible for the operation and maintenance of municipal drinking water systems took place during one-on-one consultation sessions held in November 2017.
Impacts of Prohibition Policies on the Agricultural Community	Staff summarized each policy requiring the prohibition of agricultural activities outside of WHPA-A. Through the Amendments Working Group, municipal representatives commented on the impact of these policies.
Other local considerations (i.e. Lake Ontario, Tier 3 Water Budgets)	<p>The extent to which technical work completed on Lake Ontario and the policies written to address Lake Ontario threats needed review was directed to municipalities participating in the Lake Ontario Collaborative Group (Durham Region, City of Toronto, Peel Region).</p> <p>During the one-on-one consultation sessions with municipalities in November 2017, the need to update Tier 2 and Tier 3 water budget work was discussed.</p>
Policy Effectiveness	The Source Protection Committee evaluated whether the existing policies in the CTC SPP are addressing their intended purpose at their March and September 2018 meetings.

Technical Rule Changes	Following the release of guidance in August 2018, the Amendments Working Group discussed recommendations to address technical rule changes to bring before the CTC SPC at their September 2018 meeting.
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## 1.4 Engagement and Consultation

Consultation has been integral to products developed under the *Clean Water Act, 2006*. The assessment reports, CTC Source Protection Plan, and amendments to the CTC SPP have all had a legislated requirement for public consultation. While the initial workplan content was developed by Toronto and Region Source Protection Authority as the lead SPA in the CTC SPR, effective engagement with key stakeholders was necessary for the creation of a comprehensive, local product. In addition to group meetings (Table 3), a number of one-on-one conversations with municipalities have led to the preparation of this workplan.

In November 2017, staff met independently with each of the municipalities responsible for municipal drinking water systems within the CTC SPR (Table 4). These discussions were primarily governed by the framework from the Provincial bulletin issued in December 2016. A summary of the feedback provided by municipal partners is available in Table 5.



Table 3: Record of Consultation Meetings

Date	Consultation Opportunity	Consultation Details
November 28, 2016	CTC SPC	Established a Working Group (WG) for consideration of amendments to the CTC Source Protection Plan (CTC SPP).
June 15, 2017	AWG	Discussed expectations for Section 36 Workplan.
September 6, 2017	AWG	Discussed proposed process to gather information to inform section 36 Workplan development.
September 20, 2017	CTC SPC	Endorsement of proposed process to prepare section 36 workplan.
October 18, 2017	AWG	Discussion of policies which have resulted in implementation challenges.
November 2017	Municipalities	Municipality specific meetings to discuss updates to the CTC Source Protection Plan (See Table 4)
January 10, 2018	AWG	Discussion of outcomes of one-on-one meetings with municipalities and next steps to acquire content for workplan.
February 21, 2018	AWG	Discussion of content to present to the CTC SPC.
March 21, 2018	CTC SPC	Discussion of outcomes of one-on-one meetings with municipalities, timelines to complete workplan, implementation progress, and effectiveness of policies.
May 2, 2018	AWG	Discussed timelines to complete workplan, proposed Table of Contents and necessary additional engagement.
June 27, 2018	CTC SPC	Endorsed timelines to complete update to CTC SPP and proposed Table of Contents.
September 5, 2018	AWG	Prepared recommended updates to CTC SPP for CTC SPC endorsement.
September 19, 2018	CTC SPC	Endorsement of section 36 workplan content and delegation of final workplan to the AWG.
November 19, 2018	CTC SPC, AWG, LOCG, MECP	Circulation of draft section 36 Workplan to municipalities, the Source Protection Programs Branch, and the CTC SPC for feedback.
November 20, 2018	AWG	Review of workplan.
November 30, 2018	TRSPA	Endorsement for submission to the MECP.
December 14, 2018	CVSPA	Acceptance of workplan for submission to the MECP.
December 17, 2018	CTC SPC, AWG, LOCG, MECP	End of informal consultation period for comments and revisions to workplan prior to submission to the SPPB.
December 18, 2018	AWG	Discussion of comments and necessary revisions to workplan prior to submission to the SPPB.
December 21, 2018	MECP	Submission of workplan to the MECP with letter from TRSPA and CVSPA.
January 2018	CLOSPA	Acceptance of workplan following submission to the MECP.
January 2018	MECP	Confirmation of endorsement by CVSPA and CLOSPA, in writing, to the MECP.

MECP Ministry of the Environment, Conservation, and Parks  
 AWG Amendments Working Group  
 CTC SPC CTC Source Protection Committee  
 TRSPA Toronto and Region Source Protection Authority  
 CVSPA Credit Valley Source Protection Authority  
 CLOSPA Central Lake Ontario Source Protection Authority  
 LOCG Lake Ontario Collaborative Group

Table 4: Municipal Consultation Meetings

Municipality	Meeting Date
Town of Mono	November 2, 2017
Durham Region	November 6, 2017
Peel Region	November 8, 2017
Halton Region	November 10, 2017
Town of Orangeville	November 10, 2017
Townships of Amaranth and East Garafraxa	November 16, 2017
Region of York	November 21, 2017
Town of Erin, County of Wellington	November 29, 2017

Table 5: Summary of Municipal Consultation

Section 36 Review Content	Discussion Summary
Results of Environmental Monitoring Programs	The majority of municipalities indicated their environmental monitoring did not indicate an increasing trend in particular water quality parameters. The Town of Orangeville and the Region of Halton were required to establish enhanced monitoring programs to comply with policies GEN-7 and SAL-9 in the CTC SPP by December 31, 2017. The results of these efforts were discussed at CTC Source Protection Committee Meeting #2/18.
Growth and Infrastructure Changes	New drinking water systems are anticipated in Peel Region (2019), the Town of Orangeville (2020-2021), and the Town of Erin (2020-2021). These drinking water systems are expected to be incorporated into the CTC Source Protection Plan through a minimum of three Section 34 amendments.
Council Resolutions	Only the Region of Peel has outstanding Council Resolutions to bring new drinking water systems on-line. Resolutions from the Town of Orangeville and the Town of Erin can be expected in the future.
Implementation Challenges	All municipalities indicated that the majority of their implementation challenges have been addressed through the current Section 34 Amendment being prepared. However, some policies will need to be revised to align with changes made to the Tables of Circumstances and the Technical Rules under the <i>Clean Water Act, 2006</i> .
Other local considerations (i.e. Tier 3 Water Budgets)	Consideration of numerical modeling, specifically the results and maintenance of, and updates to, the water budget tools created through the completion of the water quantity risk assessment incorporated into the CTC SPP, the Toronto & Region Assessment Report, and the Credit Valley Assessment Report, were of interest to a number of municipalities.

## 2.0 CTC Source Protection Region

There are three source protection areas which comprise the CTC Source Protection Region (Figure 3): Credit Valley, Toronto and Region, and Central Lake Ontario.

*Figure 3: CTC Source Protection Region*



The Toronto and Region Source Protection Authority leads the Drinking Water Source Protection Program in the CTC SPR. The CTC SPR contains 25 large and small watersheds and spans over 10,000 km<sup>2</sup> from the Oak Ridges Moraine in the north to Lake Ontario in the south. The CTC SPR contains portions of the Niagara Escarpment, Oak Ridges Moraine, Greenbelt, and Lake Ontario. It is the most densely populated region in Canada.

The region is complex and diverse in terms of geology, physiology, population, and development pressures, with many often conflicting water uses including drinking water supply, recreation, irrigation, agriculture, commercial and industrial uses, as well as ecosystem needs. There are differing stresses on water resources related to development pressure and population growth across the Region. Similarly, there is tremendous variability in the nature and density of drinking water quality and quantity threats from the Credit Valley Source Protection Area through to the Central Lake Ontario Source Protection Area. In particular, the majority of significant drinking water threats exist in the Credit Valley Source Protection Area because of the Issues Contributing Areas and wellhead protection areas (quantity) in Dufferin County and the Town of Halton Hills. At the other extreme, the Central Lake Ontario Source Protection Area, there are no municipal groundwater systems thereby reducing the number of significant drinking water threats.

## 2.1 Municipalities

The CTC SPR includes twenty-five (25) local municipalities and eight (8) single tier, regional or county municipalities. These municipalities are listed below in groups based on their single tier, regional, or county affiliations. The municipalities in **bold** are those responsible for providing water services.

- Dufferin County
  - **Town of Mono**
  - **Township of Amaranth**
  - **Township of East Garafraxa**
  - **Town of Orangeville**
- Wellington County
  - **Town of Erin**
- Simcoe County
  - **Township of Adjala-Tosorontio**
- Peel Region
  - City of Brampton
  - Town of Caledon
  - City of Mississauga
- Halton Region
  - Town of Halton Hills
  - Town of Oakville
  - Town of Milton
- York Region
  - Town of Whitchurch-Stouffville
  - City of Markham
  - Town of Richmond Hill
  - City of Vaughan
  - Town of Aurora
  - Township of King
- City of Toronto
- Durham Region
  - Municipality of Clarington
  - City of Oshawa
  - Town of Whitby
  - Township of Scugog
  - City of Pickering
  - Town of Ajax
  - Township of Uxbridge

## 2.2 Municipal Drinking Water Systems

In July 2015 when the CTC SPP was approved, there were 16 municipal surface water intakes obtaining drinking water to service residents from Lake Ontario (Table 6) and 66 municipal supply wells (Table 7) drawing groundwater for drinking water.

*Table 6: Surface Drinking Water Systems*

Source Protection Area	Upper Tier Municipality	Water System	Number of Intakes
Credit Valley	Peel Region	Lorne Park	1
		Lakeview	1
Toronto and Region	City of Toronto	R.C. Harris	2
		R.L. Clark	1
		F.J. Horgan	1
		Island	5
	Durham Region	Ajax	1
Central Lake Ontario	Durham Region	Oshawa	2
		Whitby	1
		Bowmanville	1
TOTAL			16

Table 7: Groundwater Drinking Water Systems

Source Protection Area	Upper Tier Municipality	Lower Tier Municipality (Water System)	Well Count
Credit Valley	Dufferin County	Mono (Island Lake)	2
		Mono (Coles)	2
		Mono (Cardinal Woods)	3
		Amaranth (Amaranth-Pullen)	1
		Orangeville (Orangeville)	12
	Wellington County	Erin (Bel-Erin)	2
		Erin (Erin)	2
		Erin (Hillsburgh)	2
	Halton Region	Halton Hills (Acton)	5
		Halton Hills (Georgetown)	7
	Peel Region	Caledon (Alton, Caledon Village)	4
		Caledon (Cheltenham)	2
		Caledon (Inglewood)	2*
Toronto and Region	Peel Region	Caledon (Caledon East)	3
		Caledon (Palgrave)	3
	York Region	Whitchurch-Stouffville	5
		King (King City)	2
		King (Nobleton)	3
		Vaughan (Kleinburg)	2
	Durham Region	Uxbridge (Uxville Well)	2
Central Lake Ontario	No municipal wells		
TOTAL			66

\* The CTC SPR is currently consulting on the addition of a new well to the Inglewood Drinking Water System through section 34 of the *Clean Water Act, 2006*. This table has not been updated to reflect this new well being incorporated into this drinking water system.

## 2.3 Growth and Infrastructure Changes

The Growth Plan for the Greater Golden Horseshoe, 2017 (Growth Plan) was released in May 2017 and came into effect on July 1, 2017, replacing the Growth Plan for the Greater Golden Horseshoe, 2006. The 2017 Growth Plan for the Greater Golden Horseshoe is a long-term plan that works with the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan to provide a framework for growth management in the region (Province of Ontario, 2017). Figure 4 outlines the Greater Golden Horseshoe Growth Plan Area.

The Growth Plan identifies that the Greater Golden Horseshoe is one of the fastest growing areas in North America with one of the World's most vibrant economies. The Growth Plan, together with the Niagara Escarpment Plan, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Provincial Policy Statement contribute to the land use planning framework to ensure the long-term maintenance of communities, the economy, and the environment in this area of the Province. Within



the Greater Golden Horseshoe, the Growth Plan provides for land use planning to the year 2041. Upper tier municipalities are expected to review and update their Official Plans to conform with the Growth Plan by June 2022, while lower tier municipalities must complete this review by June 2023. Currently, municipalities in the CTC SPR are in the process of completing this conformity exercise. In one-on-one discussions with municipalities providing water services, six municipalities identified that there will be infrastructure changes at their drinking water systems within the anticipated timeframe for updating the CTC SPP as described in this workplan. These municipalities include the City of Toronto, the Region of Durham, the Townships of Amaranth and East Garafraxa, Halton Region, and York Region.

*Figure 4: Greater Golden Horseshoe Growth Plan Area (Province of Ontario, 2017).*



The Region of Peel, the Town of Orangeville, and the Town of Erin have identified potential infrastructure changes in the next five years (2019 – 2024) (Table 8). These changes will be addressed through section 34 amendments to the CTC Source Protection Plan.

Table 8: Infrastructure Changes to Municipal Groundwater Drinking Water Systems in the CTC SPR (2019-2024)

Source Protection Area	Upper Tier Municipality	Location	Description
Credit Valley	Wellington County	Town of Erin	<p>During municipal consultations with the Town of Erin and County of Wellington staff it was communicated that the Town is planning for up to seven new production wells. The new municipal drinking water wells are all under the umbrella of the Urban Centre Water Servicing Class EA which was initiated in June 2015.</p> <p>The Erin Village and Hillsburgh Urban Centre Wastewater Servicing Class EA is for a municipal sewage collection and treatment system discharging to the West Credit River. The Servicing and Settlement Master Plan (SSMP), which preceded the sewage Class EA, identified a potential population increase to 6000 (current population is 4500) for the urban areas. During the wastewater Class EA, it was determined that the assimilative capacity of the West Credit River would allow a population of 14,559 with very stringent effluent criteria for the sewage plant. As a result, the Town is now in a position where it must find sufficient water to supply a population of 14,559. Instead of 2 or 3 wells to meet maximum daily demand for 6,000 people, the Town must now find 5 to 7 wells (with a capacity between 200 and 300 IGPM each) to supply the maximum daily demand for 14,559.</p> <p>Consultants working with the Town have had difficulty finding a viable source of drinking water. Although a number of options (new and existing wells) have been investigated, none have resulted in the identification of a viable source. Once new wells are identified, to meet the requirements of Ontario Regulation 205/18, wellhead protection areas will be delineated, and the vulnerability scoring and threats assessment will be completed. One or more Section 34 Amendments might be necessary to incorporate the technical information for these new wells into the Credit Valley Assessment Report.</p>

	Dufferin County	Orangeville DWS	The Town has recently retained a team of consultants to prepare a Schedule B Environmental Assessment for a new municipal supply well. The scope of this work will include the WHPA delineation and determination of vulnerability scoring for the new well. The timing for this work to be complete is Fall 2019. This technical work, along with the threats assessment, will be incorporated into the Credit Valley Assessment Report shortly thereafter.
	Peel Region	Caledon DWS	Caledon Village Well 4B was constructed in 2009 at the Caledon Village 3 Well Field, approximately 30 m northwest of the existing production well to address inefficiencies. Well 4B was put into production in Fall 2014 and replaced production Well 4A. The WHPA delineation, vulnerability scoring, and threats assessment are expected to be completed in early 2019 after which the information will be incorporated into the Credit Valley Assessment Report.
		Alton DWS	There are plans to bring Alton Well 4A on-line in mid-late 2019. The WHPA delineation, vulnerability scoring, and threats assessment are expected to be completed in early 2019 after which the information will be incorporated into the Credit Valley Assessment Report.
		Inglewood DWS	Inglewood Well 4 was drilled in Fall 2015. A Schedule B Environmental Assessment Study was filed with the MECP in November 2016. Design for a connection to the existing Inglewood Well 3 treatment facility was finalized in December 2016. WHPA delineation, vulnerability scoring, and threats assessment for Inglewood Well 4 has been completed. This technical work has been incorporated into the Credit Valley Assessment Report. The submission of this Section 34 Amendment is anticipated in November 2018.
Toronto and Region		Caledon East – Palgrave DWS	Caledon East 4A was drilled during Fall 2013 and was connected to the Caledon East – Palgrave DWS during summer 2016. Well 4A was brought into production in October 2017. WHPA delineation, vulnerability scoring, and threats assessment for Caledon East 4A has been completed. This technical work has been incorporated into the Toronto and Region Assessment Report. The submission of this Section 34 Amendment is anticipated in November 2018.

DWS = Drinking Water System

## 3.0 Implementing the CTC Source Protection Plan

The CTC Source Protection Plan was approved by the Minister on July 28, 2015 and came into effect on December 31, 2015. At Meeting #1/18, held on March 21, 2018, the CTC Source Protection Committee heard from municipalities on the extent of progress since the CTC SPP came into effect and implementation challenges. At this same meeting, the CTC SPR staff reviewed the status of implementing each policy in the CTC SPP. The general impression from the Committee was that the implementation was progressing well and on-target.

### 3.1 Implementation Challenges

It became apparent soon after the CTC SPP became effective that Policy REC-1 (Land Use Planning Policy for Protecting Groundwater Recharge) was going to be challenging to implement. As this was a Land Use Planning Policy, the Planning Approval Authority was charged with its implementation. In the York-Durham Wellhead Protection Area for Quantity (WHPA), the City of Vaughan, City of Markham, and Town of Richmond Hill staff, in particular voiced their concerns with implementing the policy. To address this challenge, the Amendments Working Group was tasked with assessing whether the implementation challenges would be able to wait until the CTC SPP was updated or if there was a need to pursue a Section 34 Amendment to this policy.

The AWG recommended to the CTC SPC at Meeting #2/17, held on September 20, 2017, that the Toronto and Region Source Protection Authority pursue amendments to several policies (10) in the CTC SPP through section 34 of the *Clean Water Act, 2006*. These amendments (Table 9) will be submitted to the Minister of the Environment, Conservation, and Parks in Fall 2018.

#### 3.1.1 Policy Challenges

Although a majority of the policies with implementation challenges have been addressed through the section 34 Amendment currently in process, there are six policies or groups of policies which, as a result of discussions at Amendments Working Group Meeting #3/18 (May 2, 2018) and #4/18 (September 5, 2018) are proposed for review through section 36 (Table 10).

Table 9: Summary of Proposed Policy Changes to the CTC Source Protection Plan through Section 34 of the Clean Water Act, 2006.

Policy	Rationale for Amendment	Synopsis of Amendment
T-8	Challenge	Remove requirement for conformity in 5 years from the date the CTC Source Protection Plan became effective.
Transition	Clarity	Text to clarify when a threat is considered 'existing' for an in-progress development proposal in accordance with Policy REC-1. Additionally, text to specify that, for transitioning applications that would result in an increase of impervious surface, a water balance assessment, or equivalent, is still generally required. However, based on the location and scale of development, the Planning Approval Authority has a certain level of flexibility regarding water balance requirements.
GEN-1	Flexibility	Establish a common site-specific exemption authority for Risk Management Officials.
SWG-3	Clarity	Revised policy text to ensure intent of policy is achieved.
SNO-1	Challenge	Change the approach to addressing potential future significant drinking water threats in the WHPA – B (VS = 10), WHPA – E (VS ≥ 9), and the remainder of the issues contributing area (Chloride, Sodium) from prohibition to management.
SAL-10	Gap	Address moderate and low drinking water threats as a result of the application of road salt in all vulnerable areas.
SAL-11		
SAL-12		
SAL-13		
REC-1	Clarity/Challenge	<ul style="list-style-type: none"> <li>a) Revised policy text to ensure intent of policy is achieved;</li> <li>b) Exempting development on lands down-gradient of municipal wells within the Tier 3 Water Budget WHPA-Q2 Area from having to produce a water balance assessment demonstrating that predevelopment recharge will be maintained (less onerous recharge maintenance requirements);</li> <li>c) Adding “site alteration” to the types of applications requiring BMPs with the goal of maintaining predevelopment recharge;</li> <li>d) Removing the water balance exemption for single family dwellings that represent major development (500m<sup>2</sup> or greater), while still exempting the majority of single family dwellings (i.e. less than 500m<sup>2</sup>) and now exempting applications for non-major development (less than 500m<sup>2</sup>) that require site plan control (prevents minor site alterations with little to no increase in impervious cover that trigger Site Plan review from needing a water balance);</li> <li>e) Harmonizing the Explanatory Document with the policy to clarify whether associated implementing official plan (OP) or Zoning By-law Amendment (ZBA) applications must also comply with REC-1 Policy 2; and</li> <li>f) Policy applicability for agricultural uses, agriculture-related uses, or on-farm diversified uses where the total impervious surface does not exceed 10 per cent of the lot.</li> </ul>

**Gap** – Describes a policy that, when approved by the Ministry, did not account for a particular situation.

**Clarity** – Describes a policy that municipalities found difficult to implement as a result of a lack of clarity as to the intent of the policy.

**Challenge** – Describes a policy that municipalities found difficult to implement due to practicality.

**Flexibility** – Describes a policy that municipalities found difficult to implement due to the lack of authority given the Risk Management Official to determine when site-specific land use is or is not subject to Section 59 under the *Clean Water Act, 2006*.



*Table 10: Summary of Proposed Policy Revisions to the CTC Source Protection Plan through Section 36 of the Clean Water Act, 2006.*

Policy	Suggested Action Through Update to CTC Source Protection Plan
DNAP-1 DNAP-2	Consider update to policies to include the addition of exception for small quantities.
ASM-2 ASM-4	Review of agricultural source material policies (ASM) for gaps related to allowing a risk management plan (RMP) when a Nutrient Management Plan (NMP)/Strategy (NMS) is required, but has expired; or when a Nutrient Management Plan is voluntarily in place.
ASM-1 ASM-2	Review of Policies ASM-1 and ASM-2: in particular duplication of requirements where NMP/NMS in place on a property where a risk management plan (RMP) is also required (i.e., soil testing).
FER-1 FER-2	Review of the need for prohibiting the application of commercial fertilizer in Wellhead Protection Area-A.
Lake Ontario Policies	Consider change to the implementation body.
LO-NGS-1	Consider addition to policy requiring that Ontario Power Generation designate an appropriate lead for source protection considerations.

### 3.1.2 Financial Implications

When developing policies for the CTC Source Protection Plan, the CTC Source Protection Committee was very aware of the concerns of affected residents and implementing bodies with respect to the costs associated with the implementation of certain policies. In some cases, landowners or business owners might have to bear costs to comply with the policies in the source protection plan even if not serviced by municipal water. The Committee addressed the potential financial implications to landowners in three ways:

- i) Policy GEN-4 requested that the Ministry of the Environment, Conservation, and Parks continue to maintain and expand the Ontario Drinking Water Stewardship Program and / or fund other relevant programs to enable local delivery to implement risk management measures for certain activities where they are significant drinking water threats.
- ii) Policy GEN-5 requested that where an activity is a significant drinking water threat, the municipality should consider providing incentive programs to encourage actions to reduce the risks to source water.
- iii) Wherever possible, the Committee chose Prescribed Instruments as the main policy tool to address the existing or potential future significant drinking water threat. Having the Province responsible for implementing these policies through existing mechanisms and instruments, reduces regulatory duplication and costs directed to municipalities for the implementation of Risk Management Plans.

The Ontario Drinking Water Stewardship Program provided \$24.5 million to landowners between 2010 and 2014 to assist landowners with the implementation of local risk management measures with the goal of protecting water supplies. This Program was highly successful and showed commitment on the part of the Provincial government to assist landowners with the costs borne by implementing source

protection plan policies. In the case of the CTC Source Protection Region, the Ontario Drinking Water Stewardship Program had already ended its term by the time the source protection plan had been approved by the Minister of the Environment, Conservation, and Parks. A number of landowners impacted by the policies in the CTC Source Protection Plan were supported financially in meeting the requirements of the CTC Source Protection Plan policies. However, the long-term implementation of the Drinking Water Source Protection Program would benefit from a commitment by the Province to support the costs of risk management measures being put in place by landowners to protect sources of drinking water, even if simply a first-come, first-serve fund.

In the CTC Source Protection Region, a number of municipalities have made the risk management measures required for Risk Management Plans eligible for shared funding through an already established or new incentive program (Table 11).

*Table 11: Financial Incentive Programs Supported by Municipalities in the CTC Source Protection Region*

Municipality	Incentive Program				
	Toilet Rebate	Rain Barrel	Well Decommissioning	Agricultural BMPs	Other RMMs
Wellington County					
Halton Region					
Town of Orangeville					
Peel Region					
Durham Region					
York Region					

RMMs = Risk Management Measures

BMPs = Best Management Measures

Municipalities in the CTC Source Protection Region have also been supported financially by the Source Protection Municipal Implementation Fund (SPMIF) established by the Province. Created in 2013, this fund gave an additional \$13.5 million to over 180 small, rural municipalities to help with the start-up costs of source protection plan implementation. In the CTC Source Protection Region, 14 (fourteen) municipalities received a combined total of \$572,809 to assist with getting ready for implementation or actually implementing policies in the source protection plan. This funding also gave municipalities additional funding where working collaboratively which was the case in Dufferin County where the municipalities developed provisions of a Joint Municipal Water Supply Management Model. Other municipalities in the CTC Source Protection Region used this funding to complete the mandatory on-site septic system inspections, establish risk management plans, and satisfy Policy T-8 to bring their Official Plan into conformity with the source protection plan.

## 3.2 Impact of Prohibition Policies

The prohibition of activities is considered to be a very strong approach to addressing significant drinking water threats. Prohibition of *existing* threats to reduce risks to source water can be very challenging – financially and politically. Stopping activities that are already taking place can be very costly and have a serious impact on the business and / or property owner affected. When source protection plan policies were first being developed across the Province, the Ministry of the Environment, Conservation, and Parks encouraged that, wherever possible, it would be preferable to use other available tools to

adequately reduce the risk created by an existing threat. Choosing to manage, rather than prohibit a threat can help ensure that existing activities and businesses are not penalized unfairly.

Choosing prohibition as a policy approach for future threats may provide some advantages. If activities that would be significant drinking water threats are not already established, prohibition can be very effective and efficient to prevent them from ever becoming established and becoming significant risks to local drinking water sources. Prohibition of specific future activities in highly vulnerable areas would mean that hazardous activities get located in less vulnerable areas.

### 3.2.1 Agricultural Policies

The Ontario Ministry of Agricultural, Food, and Rural Affairs (OMAFRA) has long advocated that significant drinking water threat activities outside of Wellhead Protection Area (WHPA) A or Intake Protection Zone (IPZ) 1 can be effectively managed to reduce the risk to drinking water, without the need for prohibition. While OMAFRA recognizes prohibitions are guaranteed to be effective, they have commented that agricultural science and best practices have been proven to protect water resources which allowing farming activities to continue.

Source protection committees were encouraged to undertake a desktop assessment, prior to finalizing their policy approach, to evaluate the impact of prohibitions on each individual property. This assessment indicated that policies did not have significant impacts on agricultural operations when evaluated at the individual property level. OMAFRA, however, has communicated that the cumulative impact of prohibition policies in source protection plans could impact the long-term viability of agriculture in some areas of the province.

As an element of the Section 36 Workplan, source protection authorities have been asked to review the cumulative impact of their policies and assess whether or not these policies are having a notable impact, either through a negative impact on agricultural operations, or from a positive impact on water quality. Guidance was issued by the MECP in March 2018 which suggested an approach to this exercise.

There are eleven agricultural policies in the CTC Source Protection Plan that require prohibition of activities outside of the WHPA-A (Table 12). There are no drinking water intakes in the CTC Source Protection Region where agricultural activities are classified as significant drinking water threats. To carry out the assessment described in the guidance issued in March 2018, Risk Management Officials responsible for the implementation of prohibition policies in the CTC SPR were contacted and asked to provide data.

Four municipalities (York Region, Halton Region, Peel Region, and Wellington County) in the CTC Source Protection Region have properties affected by the current agricultural prohibition policies. Risk Management Officials have communicated that, to date, there have been no negative repercussions on agricultural operations as a result of implementing these policies. For example, no landowner was required to remove cropland from service or decrease the livestock at their operation.

The Amendments Working Group, at Meeting #4/18, on September 5<sup>th</sup> discussed whether the group should recommend to the CTC SPC that the policies requiring the prohibition of agricultural activities outside of the WHPA-A be reviewed as a component of updating the CTC Source Protection Plan. After considerable dialogue, members of the AWG felt that the risk management measures being put into place through an active risk management plan should be sufficient to address significant agricultural

drinking water threats outside of the WHPA-A. In particular, members of the AWG felt it important to keep in mind that source protection is but one of the barriers in the Drinking Water Safety Net the Province of Ontario has implemented. With this direction from the AWG, the CTC Source Protection Committee endorsed revisiting the policies which require prohibition of agricultural activities, through the update to the CTC Source Protection Plan, to determine whether they should remain in place.

### 3.2.2 Other Prohibition Policies in the CTC Source Protection Plan

Although the guidance from the MECP did not require the review of other policies in the source protection plan which prohibited activities outside of the WHPA-A, the CTC Source Protection Committee felt that it essential that the workplan submitted to the Province at least list these policies (Table 13). Prohibition policies outside of the WHPA-A exist for the following additional prescribed drinking water threats:

- The establishment, operation, or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act*.
- The establishment, operation, or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage.
- The handling and storage of road salt.
- The storage of snow.
- The handling and storage of fuel.
- The handling and storage of a dense non-aqueous phase liquid.
- The handling and storage of an organic solvent.

The CTC Source Protection Committee heard from Town of Orangeville staff at the Meeting #1/16 held on November 26, 2016 that there were challenges with the implementation of Policy SNO-1 (Storage of Snow). Given the amount of the Town covered by the Issues Contributing Areas for chloride and sodium, prohibiting future threats related to the storage of snow was a challenge. The current Section 34 amendments being proposed by Toronto and Region Source Protection Authority recommends that the future prohibition of snow storage be restricted to the WHPA-A (Table 9).

Table 12: CTC Source Protection Plan Policies Prohibiting Agricultural Activities Outside of the WHPA-A and the Number of Affected Properties

Policy	Description	Tool	Prohibition Area outside of WHPA-A	Properties Affected
ASM-1	Application of Agricultural Source Material to Land	Prescribed Instrument	<ul style="list-style-type: none"> <li>WHPA-B (VS = 10) in an ICA for Pathogens (future); or</li> <li>WHPA-E in an ICA for Nitrates or Pathogens (future).</li> </ul>	7
ASM-2		Part IV		10
ASM-3	Storage of Agricultural Source Material	Prescribed Instrument	<ul style="list-style-type: none"> <li>WHPA-B (VS = 10) in an ICA for Nitrates or Pathogens (future); or</li> <li>WHPA-E in an ICA for Nitrates or Pathogens (future).</li> </ul>	10
ASM-4		Part IV		10
ASM-5	Management of Agricultural Source Material (Aquaculture)	Prescribed Instrument	<ul style="list-style-type: none"> <li>An ICA for Pathogens (existing, future)</li> </ul>	0
NASM-3	Application of Non-Agricultural Source Material to Land		<ul style="list-style-type: none"> <li>WHPA-B (VS = 10) (future); or</li> <li>WHPA-E (VS ≥ 8) (future); or</li> <li>The remainder of an ICA for Nitrates or Pathogens (future).</li> </ul>	70
NASM-4	Handling and Storage of Non-Agricultural Source Material		<ul style="list-style-type: none"> <li>WHPA-B (VS = 10) (existing, future); or</li> <li>WHPA-E (VS ≥ 8) (existing, future); or</li> <li>The remainder of an ICA for Nitrates or Pathogens (existing, future).</li> </ul>	70
LIV-2	The Use of Land as an Outdoor Confinement Area of a Farm-Animal Yard	Prescribed Instrument	<ul style="list-style-type: none"> <li>WHPA-B (VS = 10) in an ICA for Nitrates or Pathogens (future); or</li> <li>WHPA-E in an ICA for Nitrates or Pathogens (future).</li> </ul>	10
LIV-3		Part IV		10
FER-1	Application of Commercial	Prescribed Instrument	<ul style="list-style-type: none"> <li>WHPA-E in an ICA for Nitrates (future)</li> </ul>	7
FER-2	Fertilizer to Land	Part IV		7



Table 13: CTC Source Protection Plan Policies Prohibiting Activities Outside of the WHPA-A

Policy	Description	Tool	Prohibition Area outside of WHPA-A
WST-3	Application of Untreated Septage to Land	Prescribed Instrument	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future)</li> <li>• WHPA-E (VS ≥ 8) (future)</li> <li>• The remainder of an ICA for Nitrates or Pathogens (future)</li> </ul>
WST-4 WST-5	<ul style="list-style-type: none"> <li>• Storage, treatment, and discharge of tailings from mines;</li> <li>• Landfarming of petroleum refining waste;</li> <li>• Landfilling (hazardous waste);</li> <li>• Landfilling (municipal waste);</li> <li>• Landfilling (solid-non-hazardous industrial or commercial waste);</li> <li>• Liquid industrial waste injection into a well;</li> <li>• Storage of hazardous or liquid industrial waste (large facilities such as landfills and transfer stations); and</li> <li>• Storage of wastes described in clauses (p), (q), (r), (s), (t), or (u) of the definition of hazardous waste, or in clause (d) of the definition of liquid industrial waste (at large facilities such as landfills and transfer stations).</li> </ul>	Prescribed Instrument  Land Use Planning	<ul style="list-style-type: none"> <li>• Where the activity would be a significant drinking water threat (future)</li> </ul>
WST-6	PCB Waste Storage	Part IV	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future)</li> <li>• WHPA-E (VS = 10) (future)</li> </ul>
SWG-15 SWG-16	Storage of Sewage	Prescribed Instrument Land Use Planning	<ul style="list-style-type: none"> <li>• WHPA-E (VS ≥ 9) (future)</li> <li>• WHPA-E in an ICA for Nitrates or Pathogens (future)</li> </ul>

Table 13: CTC Source Protection Plan Policies Prohibiting Activities Outside of the WHPA-A (continued)

Policy	Description	Tool	Prohibition Area outside of WHPA-A
SWG-17  SWG-18	<ul style="list-style-type: none"> <li>• Combined Sewer Discharge from a Stormwater Outlet to Surface Water;</li> <li>• Sewage Treatment Plant (STP) Bypass Discharge to Surface Water;</li> <li>• Industrial Effluent Discharges; and</li> <li>• Sewage Treatment Plant Effluent Discharges (Includes Lagoons).</li> </ul>	Prescribed Instrument  Land Use Planning	Combined Sewer Discharge <ul style="list-style-type: none"> <li>• Where the establishment, operation, and maintenance of sewage works would be a significant drinking water threat (future).</li> </ul> STP Bypass Discharge <ul style="list-style-type: none"> <li>• WHPA-E (VS <math>\geq</math> 8) (future); or</li> <li>• WHPA-E in an ICA for Nitrates or Pathogens (future).</li> </ul> Industrial Effluent Discharges <ul style="list-style-type: none"> <li>• WHPA-E (VS <math>\geq</math> 8) (future); or</li> <li>• WHPA-E in an ICA for Nitrates, Pathogens, or Chlorides (future).</li> </ul> STP Effluent Discharges <ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future); or</li> <li>• WHPA-E (VS <math>\geq</math> 8) (future); or</li> <li>• WHPA-E in an ICA for Nitrates or Pathogens</li> </ul>
SAL-7	Handling and Storage of Road Salt	Part IV	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future); or</li> <li>• WHPA-E (VS <math>\geq</math> 9) (future); or</li> <li>• The remainder of an ICA for Nitrates or Pathogens (future).</li> </ul>
SNO-1	Storage of Snow	Part IV	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future); or</li> <li>• WHPA-E (VS <math>\geq</math> 9) (future); or</li> <li>• The remainder of an ICA for Nitrates or Pathogens (future).</li> </ul>

Table 13: CTC Source Protection Plan Policies Prohibiting Activities Outside of the WHPA-A (continued)

Policy	Description	Tool	Prohibition Area outside of WHPA-A
FUEL-2	Handling and Storage of Fuel (Aggregate Extraction Sites)	Prescribed Instrument	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (existing, future); or</li> <li>• WHPA-E (VS = 10) (existing, future).</li> </ul>
FUEL-3	Handling and Storage of Fuel <ul style="list-style-type: none"> <li>• Liquid Fuel and Fuel Oil in Non-Residential (Includes ICI, Farm); or</li> <li>• Multi-unit Residential and Small business in quantities <math>\geq 2500</math> litres above or below grade.</li> </ul>	Part IV	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future); or</li> <li>• WHPA-E (VS = 10) (future).</li> </ul>
DNAP-1	Handling and Storage of a Dense Non-Aqueous Phase Liquid	Part IV	<ul style="list-style-type: none"> <li>• WHPA-B (future); or</li> <li>• WHPA-C (future); or</li> <li>• WHPA-E (VS = 10) (future).</li> </ul>
OS-1	Handling and Storage of an Organic Solvent	Part IV	<ul style="list-style-type: none"> <li>• WHPA-B (VS = 10) (future); or</li> <li>• WHPA-E (VS = 10) (future).</li> </ul>

### 3.3 Policy Effectiveness

Section 22 of Ontario Regulation 287/07 requires that a source protection plan contain the following objectives:

- Protect existing and future drinking water sources; and
- Ensure that activities identified as *significant drinking water threats* either new become a threat or, if the activity is already taking place, the activity ceases to be a *significant drinking water threat*. In having the threat cease to be significant, the policies in the source protection plan are managing the activity so that the risk is reduced, not necessarily eliminated.

Further, the four monitoring policies in the CTC Source Protection Plan require the implementing body responsible for a particular policy's implementation to report on the "information related to the *effectiveness* of the policies in ensuring a threat ceases to be, or does not become significant".

This section of the workplan discusses the effectiveness of the CTC Source Protection Plan in managing existing *significant drinking water threats* and eliminating future *significant drinking water threats*.

#### 3.3.1 Annual Reporting

The CTC Source Protection Region submitted its first annual report to the Ministry of the Environment, Conservation, and Parks in May 2018. In this first annual report, the CTC Source Protection Committee identified that 90% of the policies written to manage or eliminate significant drinking water threats have been implemented. The remaining 10% of these policies are either in the process of being implemented (9%) or at the end of December 2017, no implementation progress had been made (1%). The Committee chose to submit the rating of "progressing well" in reporting to the Province.

The Lake Ontario Policies (Prefix: LO-) are *Specify Action* policies directed at the Ministry of the Environment, Conservation, and Parks. Although there has been progress on these policies (i.e., the Lake Ontario Collaborative Group has been created), there has been some mention among CTC SPC members that if the implementing body for certain policies were changed, implementation might be further along. In reviewing the CTC SPP, the Committee, the City of Toronto, the Region of Durham, and Peel Region will discuss the appropriateness of changing the implementing body for the Lake Ontario policies.

A summary of the CTC Source Protection Plan implementation can be found in Appendix 2.

#### 3.3.2 Measuring Effectiveness

In MECP Source Protection Bulletin: Overview of Requirements for Assessment Report and Source Protection Plan Amendments under Section 36 of the *Clean Water Act, 2006*, source protection authorities, municipalities, and source protection committees are asked to consider *policy effectiveness*. Methods proposed to evaluate *policy effectiveness* included consideration of the source protection plan's implementation documented in the annual report. Also, to consider whether changes were necessary to address policy gaps or ineffective policies. Similarly, all four of the monitoring policies in the CTC Source Protection Plan contain the terminology that "*annual reporting shall include information*

*related to the effectiveness of the policies in ensuring a threat ceases to be, or does not become significant”.*

The CTC Source Protection Committee discussed the concept of *effectiveness* at its meetings held in March and September 2018. Members felt that source protection committees across the Province should be looking at effectiveness from a much bigger scale. Essentially, it was felt that the extent to which source protection plans have been effective should be related back to the quality and quantity of source water. Every existing or potential future threat enumerated in assessment reports across the Province were required to have a policy to ensure that a particular threat ceased to be, or did not become significant. Therefore, looking at which threats or group of threats have resulted in the direct impact on the quality and quantity of municipal drinking water sources might be an approach to evaluating the success of source protection plan implementation. This approach, however, could only be employed only after all source protection plan policies have been implemented for each existing or future significant drinking water threat enumerated.

For example, in the CTC Source Protection Plan, the longest timeline for policy implementation is 5 years (T-6). This timeline is associated with existing activities designated for the purpose of Section 58 under the *Clean Water Act, 2006*, requiring risk management plans. Therefore, all existing significant drinking water threats requiring a risk management plan shall have one in established by December 31, 2020. In the 2021-2022 Chief Drinking Water Inspector Report, ideally there should be few, if any, exceedances of standards used to evaluate raw water at municipal drinking water intakes.

This topic is one that the CTC Source Protection Committee felt that support from the Environmental Commissioner of Ontario or Auditor General’s Office could be useful.

### 3.3.3 New Policies to Address “Gaps”

There are five policies or groups of policies which will be considered in the update of the CTC Source Protection Plan. Three policies or group of policies are considered gaps in the current source protection plan and relate to transportation corridors, signage, and transport pathways. One group of policies will address the addition of liquid hydrocarbon pipelines as a new prescribed threat. Lastly, an additional group of policies, those related to re-evaluation of the *issue* designation at drinking water systems in the Credit Valley Source Protection Area, are currently required to implement the current CTC SPP. The rationale for these new policies are described in Table 14.

Table 14: Summary of Proposed New Policies to the CTC Source Protection Plan through Section 36 of the Clean Water Act, 2006.

Topic	Rationale for Consideration Through Update to CTC Source Protection Plan
Transportation Corridors	<p>Section 26.6 of Ontario Regulation 287/07 (General), specifies that a source protection plan may set out policies identifying the actions to be taken by persons or bodies to update spill prevention and spill contingency plans or emergency response plans for the purpose of protecting existing drinking water sources with respect to spills that occur within a wellhead protection area (WHPA) or surface water intake protection zone (IPZ) along highways, as defined in subsection 1(1) of the <i>Highway Traffic Act</i>, railway lines or shipping lanes.</p> <p>Under the current framework, a policy written to address transportation corridors would be classified as <i>specify action</i> and would not be legally-binding. However, given the number of major highways and railways that transverse wellhead protection areas in the CTC Source Protection Region, it has been determined that a new policy(ies) to encourage municipal spill prevention, spill contingency planning, and emergency response planning to reduce the risk of spills along highways and railways should be considered in updating the source protection plan.</p> <p>Alternatively, the CTC SPC may choose to add the <i>transportation of substances</i> as a local threat. If this is the case, significant threat policies can be written to address the threat. The review to the CTC Source Protection Plan will evaluate which, if any, new policies need to be added to address transportation corridors.</p>
Transport Pathways	<p>Municipalities have limited authority to regulate transport pathways. Areas where municipal authority may extend include geothermal systems, as well as some control over grading (e.g., ditches, trenches). The Province has authority for Regulation 903 (Wells) under the <i>Ontario Water Resources Act</i> and oversight of wells is an important component in the protection of groundwater aquifers.</p> <p>The CTC SPC has discussed the establishment of a new policy or policies to complement Section 27(3) of <i>Ontario Regulation 287/07</i>, which requires municipalities to notify the SPA and SPC of any proposals to create new transport pathways within vulnerable areas.</p>
Signage	<p>Many source protection plans in the Province contain a signage policy. Such policies ensure that there are signs installed along main roads at locations where these roads enter vulnerable areas with high vulnerability scores. The purpose of this signage is to increase the awareness of the location of vulnerable areas. Many municipalities with jurisdiction in other source protection regions communicated the value in having signage as an education and outreach tool.</p>
Address Sodium and Chloride Issues	<p>Policy SAL-9 requires the Credit Valley Source Protection Authority, in partnership with affected municipalities, to determine whether new source protection plan policies are needed to prevent future drinking water issues. This policy has been implemented through the establishment of monthly sampling of sodium and chloride levels in raw water at affected wells. The review of these raw water results will be a component of the update to the CTC SPP.</p>
Liquid hydrocarbon pipelines	<p>With the addition of the establishment and operation of a liquid hydrocarbon pipeline as a prescribed threat, CTC Source Protection Plan policies will need to be reviewed and revised if necessary as text currently written refers to a local threat.</p>



## 4.0 The Science Supporting the CTC Source Protection Plan

A key requirement of the *Clean Water Act, 2006*, the Assessment Report is the scientific backbone on which source protection plan policies rest. It includes information such as:

- The physical characteristics of the land in the watershed;
- Land use;
- The location of drinking water sources;
- A review of the amount of water being used and how much is available for future uses;
- Where vulnerable water sources are located; and
- Potential threats that may compromise drinking water sources, whether through contamination or overuse.

The *Director's Technical Rules* stipulate the contents of the report and various methodologies that can be applied in drafting the Assessment Report, and allow for the consideration of local conditions.

### 4.1 Technical Rule Changes

The *Director's Technical Rules* were first released in 2008. Since that time, they have been updated a number of times. Most recently, in March 2017, the changes to the *Director's Technical Rules* provided clarity with respect to terminology, removed redundancies, incorporated flexibility and new scientific approaches, and updated the Tables of Drinking Water Threats. In 2018, the Province amended Regulation 287/07 to include the *establishment and operation of a liquid hydrocarbon pipeline as a prescribed drinking water*. This amendment required the addition of new circumstances to the Tables of Drinking Water Threats.

In August 2018, the Source Protection Programs Branch released a Bulletin to provide clarity on incorporating the 2017 and 2018 rule changes into workplans and plan amendments developed under section 36 of the *Clean Water Act, 2006*. The municipalities and source protection authorities in the CTC Source Protection Region, together with the CTC Source Protection Committee, have reviewed the most recent *Director's Technical Rules* to determine whether local circumstances will influence what changes to the CTC Source Protection Plan will be necessary to conform with the current *Director's Technical Rules* (Table 15).

The Ministry of the Environment, Conservation, and Parks has been undertaking a review of the Drinking Water Source Protection Program over the past couple of years. This review has focused on the Program Framework, Policy Development and Implementation Framework, and the Technical Framework. The changes to the *Director's Technical Rules* in 2017 and 2018 have been related to this review, however, a number of other proposals continue to be in development. Updates to the CTC Source Protection Plan and its associated reference materials (i.e., Assessment Reports, Explanatory Document) will incorporate the most up-to-date legislation and *Director's Technical Rules*, wherever possible.

*Table 15: Technical Rule Changes Proposed for Inclusion in Updated CTC Source Protection Plan*

Technical Rule	Technical Rule Change	Anticipated Workplan Task	
		Yes	No
Mandatory			
Rules 8(10, 13(5), 80, 81 (Part VII.2); Tables of Drinking Water Threats	Removal of Part VII.2 – Significant Groundwater Recharge Areas, including rules 80 and 81, removal of references to vulnerability scoring in SGRAs, including references to the Tables of Drinking Water Threats	√	
Rule 45	The rule explicitly lists the systems that are excluded from the SGRA delineation requirements (i.e. Great Lakes).	√	
Sewage / Septic Systems and Holding Tanks	Removal of sodium and chloride references from the circumstances (695-715) related to on-site sewage systems and handing tanks.		√
Handling and Storage of Fuel	Changes to the underlying calculations that determine where above grade handling and storage of fuel can be a significant drinking water threat. This change added above grade fuel storage as a significant risk in intake protection zones and WHPA-Es.	√	
Agriculture Threats / Application and Storage of NASM	Removal of the term “dairy producer” from circumstances 1965-1967.	√	
Liquid Hydrocarbon Pipeline	Introduced new threat circumstances (1972 – 1979) for pipelines regulated under Ontario Regulation 210/01 of the <i>Technical Standards and Safety Act</i> or that is subject to the <i>National Energy Board Act</i> where the pipeline is above or below ground or is above or underneath a water body.	√	
Enabling Provisions			
Rule 1(1)	The addition of a transport pathway definition for surface water intakes.	√	
Rule 1(1)	The definition of “soil, groundwater, and sediment standards” were amended to explicitly refer to the drinking water component (i.e. GW1 or S-GW-1). The previous definition in the <i>Director’s Technical Rules</i> did not specify what component of the standards should be used when assessing the presence of a contaminant in a vulnerable area.		√
Rule 1(4)	The addition of a high water mark definition and alignment with the method described in the document entitled “Fish Habitat and Determining the High Water Mark on Lakes”; published by the Department of Fisheries and Oceans, 2005.	√	
Rules 62(2), 65(1b), 68(2b), and 70(2b)	Amendment of the <i>Director’s Technical Rules</i> to allow the setback from a water body to be reduced based on local conditions without approval from the Director.	√	
Technical Rule	Technical Rule Change	Anticipated Workplan Task	
		Yes	No
Rule 72	Addition of “and Natural Surface Water Features” to the Part VI.6 title.	√	
Rule 95.1	Creation of an exemption to the standard rules related to vulnerability scores for drinking water systems in large water bodies, including the Great Lakes or connecting channels. This exemption allows higher vulnerability scores to be assigned to		√

	protection areas around drinking water systems in larger water bodies where local circumstances and information indicate the intake is vulnerable to contamination.		
Rule 114 and other rules where the term “monitoring well” was mentioned in previous versions of the technical rules	Replacing the term “monitoring well” with “monitoring location”.		✓
Rule 126(5)	Addition of “in an intake protection zone” to the rule identifying sediment based contamination as a risk to surface water.		✓
Rule 126(6)	Allowing the identification of groundwater based contaminated sites in surface water based vulnerable areas.		✓
Rules 139(1) and 141(4)	Addition of a requirement around when a condition site can be identified as a significant drinking water threat under any approach. The amendment limits this to sites where the condition has already contaminated, or has the potential to contaminate, a source of drinking water.		✓
Tables of Drinking Water Threats	Aligning the non-legal wording (“short names”) with the legal description.		✓

## 4.2 Environmental Monitoring

The CTC Source Protection Plan contains three policies which require monitoring of water quality associated with *issues* identified under the *Clean Water Act, 2006* or the potential for increasing water quality trends (Table 16). There will be four potential updates to the CTC Source Protection Plan related to environmental monitoring. These updates are discussed in Section 4.2.1.5.

Table 16: Policies in the CTC Source Protection Plan Related to Environmental Monitoring

Policy	Municipalities Impacted	Policy Requirements
GEN-7	Halton Region, Town of Orangeville, Peel Region	Municipalities with groundwater systems showing increasing or decreasing trends or exceedances of Ontario Drinking Water Standards shall investigate these trends.
SAL-9	Halton Region, Town of Orangeville	Credit Valley Source Protection Authority will work with impacted municipalities to assess the monthly sampling results of sodium and chloride levels in raw water for any increasing trends.
SAL-13	Town of Mono, Town of Orangeville, City of Toronto, York Region, Peel Region, Halton Region, Durham Region	Municipalities conducting sodium and chloride monitoring under the <i>Safe Drinking Water Act, 2002</i> are requested to provide these results to the appropriate source protection authority.

#### 4.2.1 Water Quality Monitoring associated with the Identification of an *Issue*

During the November 2017 meetings with CTC SPR municipalities responsible for the treatment and distribution of drinking water (Table 4), each municipality was asked to identify any increasing or decreasing trends in any parameters monitored under the *Safe Drinking Water Act, 2002*. As indicated earlier in this document, the majority of municipalities confirmed that their environmental monitoring did not indicate an increasing trend in particular water quality parameters.

Therefore, excepting at drinking water systems where an issue has already been defined under *Director's Technical Rule 114*, no water quality parameter listed in Schedules 1, 2, or 3 of the Ontario Drinking Water Standards or Table 4 of the Technical Support Document of the Ontario Drinking Water Standards, Objectives, and Guidelines is:

- a) Present at a concentration that may result in the deterioration of the quality of the water for use as a source of drinking water, or
- b) Shows a trend of increasing concentrations at the surface water intake, well, or monitoring location and a continuation of that trend would result in the deterioration of the quality of the water for use as a source of drinking water.

##### 4.2.1.1 The Designation of an *Issue* at Municipal Drinking Water Systems in the CTC Source Protection Region

During the development of the *Approved Updated Assessment Report: Credit Valley Source Protection Area, 2015* (CVAR), raw water quality data for municipal wells were collated and analyzed. The data review spanned a period extending from the installment of each municipal well to the end of 2012.

The dataset for each well was plotted to assess the change in parameter concentration over time. The data were then subject to linear regression analyses and trend projection, where the point of irreversible water quality deterioration was assessed as being the time (year) that the projected (concentration) trend line intercepted the Ontario Drinking Water Standard (ODWS) for the parameter of concern.

In conjunction with the *Director's Technical Rules*, the following local criteria were applied in the designation of an *issue*:

- 30-year time horizon for interception of the trend line with the ODWS;
- Frequency with which a parameter exceeds half of its maximum allowable concentration (1/2 MAC) under the ODWS; and
- Specific vulnerability concerns relating to the municipal well.

Four drinking water systems in the CTC Source Protection Region have an *issue*, as defined by *Director's Technical Rule 114 (Table 17)*. All four drinking water systems are located in the Credit Valley Source Protection Area.

*Table 17: Drinking Water Systems in the CTC SPR with an issue designation per Director's Technical Rule 114.*

Drinking Water System	Drinking Water Well	Parameter of Concern	Description of Issue
Orangeville	Wells 6, 9A, 9B	sodium, chloride	At the time the Credit Valley Assessment Report was prepared, trend plots showed a distinctive upward change. Concentrations were below the Ontario Drinking Water Standards (ODWS) at that time for both sodium (200 mg/L) and chloride (250 mg/L), but based on projections they are anticipated to exceed the ODWS within the next 30 years if the trends were to continue.
	Wells 10, 11	chloride	
Inglewood	Well 2	pathogens	At the time the Credit Valley Assessment Report was prepared, Peel Region reported exhibited periodic hits of total coliforms since 2002. Measured concentrations of total coliforms were often recorded following large storm events. Given these observations, it was assumed that these occurrences may be associated with a stormwater management pond located in close proximity to the well.  Due to the shallow and unconfined nature of the aquifer supplying Well 2, there is a strong possibility that a direct connection or a very short flow path exists between the surface water and the supply aquifer.
Davidson (Acton)	Wells 1, 2	nitrites	Nitrate concentrations in raw water taken at the Davidson Wellfield has shown a great deal of variability since 1985. Statistical analyses completed for the Credit Valley Assessment Report showed that the ODWS could be met as early as 2019 at Well 1. The ODWS is not expected to meet or exceed the criterion until 2127. Further, data for both wells exhibited repeated spikes over the ½ maximum acceptable concentration (MAC) at several times between 2000 and 2009.
Cedarvale (Georgetown)	Wells 1A, 4, 4A	chloride	Statistical analyses completed at the time the Credit Valley Assessment Report was being prepared showed that between 1986 and 2009, these wells showed marked increases in chloride concentrations.

#### 4.2.1.2 Water Quality Monitoring – Orangeville

Per the requirements of Policy SAL-9, Credit Valley Source Protection Authority worked collaboratively with the Town of Orangeville staff to assess the water quality data collected at the Town's municipal

wells. The methodology used to assess the raw water quality data was the same as that used in the initial *issue* assessment.

- The full dataset for each well was plotted to assess the change in parameter concentration over time.
- The data were then subject to linear regression analyses and trend projection up to the time (year) that the projected (concentration) trend line intercepted the ODWS for the parameter of concern.
- Once the trend analyses were completed, the ODWS interception point for the parameter of concern was recorded and compared with those inferred using the original CVAR dataset.
- Any differences in the skew of the trend projection and/or point of interception with the ODWS was reviewed in terms of potential impact of the implementation of SPP policies GEN-7 and/or SAL-9 on the raw water quality of the wells.

### Sodium

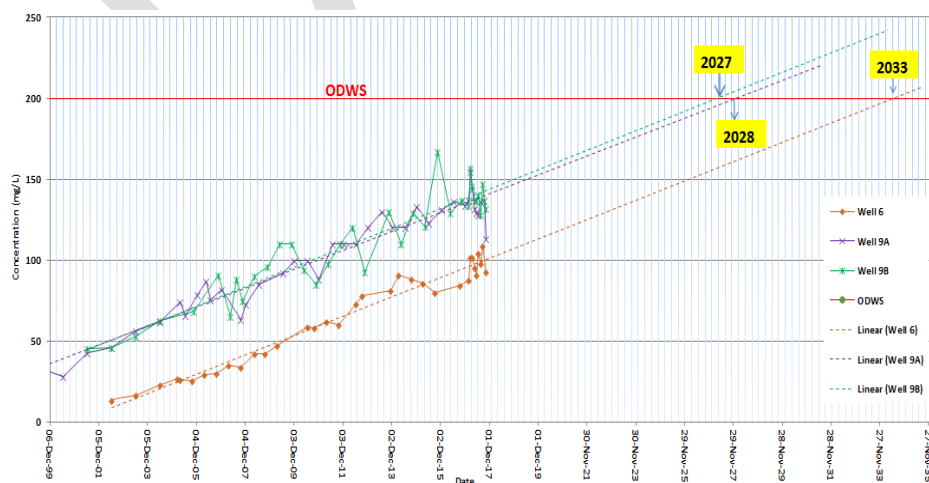
The variation in sodium concentrations of the raw water from Wells 6, 9A and 9B, was assessed for the period 1999-2017. These results and trend projections are presented in Figure 5. The analyses conclude that with the extended dataset to 2017, the overall parameter trend and interception points with the ODWS remain relatively unchanged for the three wells, when compared to the analyses informing the CVAR. The comparisons are presented in Table 18.

*Table 18: Town of Orangeville (Wells 6, 9A, and 9B) – Summary of Projected Exceedances for Sodium*

Review Period	Projected Exceedance of ODWS for Sodium	Review Period	Projected Exceedance of ODWS for Sodium
<b>Well 6</b>		<b>Well 9B</b>	
2002 – 2012*	2034	2001-2012*	2026
2002 - 2017	2033	2001-2017	2027
<b>Well 9A</b>			
1999 – 2012*	2025		
1999 – 2017	2028		

*\*Based on analyses completed for Credit Valley Assessment Report Foundation Report "Issues Analyses, Town of Orangeville Wells, September 2013".*

*Figure 5: Town of Orangeville Wells – Sodium Concentrations, 1999-2017*





## Chloride

The variation in chloride concentrations of the raw water from Wells 6, 9A, 9B, 10 and 11, was assessed for the period 1999-2017. These results and trend projections are presented in Figures 6, 7, and 8, respectively. The analyses conclude that with the extended dataset to 2017, the overall timeline for interception with the ODWS has decreased for Wells 9A, 9B and 11 (when compared to projections informing the conclusions of the approved CVAR), but remain relatively unchanged for the other two wells. These results suggest an increase in chloride concentrations in the raw water quality for Wells 9A, 9B, and 11. The comparisons are presented in Table 19.

*Table 19: Town of Orangeville (Wells 6, 9A, 9B, 10, and 11) – Summary of Projected Exceedances for Chloride*

Review Period	Projected Exceedance of ODWS for Chloride	Review Period	Projected Exceedance of ODWS for Chloride
<b>Well 6</b>		<b>Well 10</b>	
2002 – 2012*	2019 (2043*) <sup>1</sup>	2001-2012*	2033
2002 - 2017	2018	2001-2017	2038
<b>Well 9A</b>		<b>Well 11</b>	
1999 – 2012*	2018	2002-2012*	2041
1999 – 2017	2014 <sup>2</sup>	2002-2017	2026 <sup>3</sup>
<b>Well 9B</b>			
2001-2012*	2018		
2001-2017	2014 <sup>2</sup>		

\* Based on analyses completed for Credit Valley Assessment Report Foundation Report “Issues Analyses, Town of Orangeville Wells; September 2013”

1. The raw water quality dataset used in the preparation of the CVAR was from 1983 through 2012. This dataset had an interruption in the trend line in 2002 which correlated with the completion of a major commercial and retail development in the capture zone of the municipal well. As such, a decision was made to shorten the data record to include the assessment of only post-2002 data when making predictions for future sodium and chloride trends given that the application of road salt would likely change with the new land use. This decision was implemented in the assessment of future sodium concentrations, but was erroneously omitted for chloride in the CVAR Foundation Report, and by extension, in the CVAR itself. By restricting the dataset to post -2002 and expanding the dataset by five years to include 2013 through 2017 data, projected exceedance of the ODWS exceedance could occur as early as 2018. In reviewing the expanded dataset, chloride concentration in the raw water exceeded the ODWS in three instances in 2017. This municipal well has shown consistent exceedances of the ½ ODWS since 2010.
2. The dataset analyzed and incorporated into the CVAR projected an exceedance of chloride in the year 2018. The data provided by the Town of Orangeville for 2013 through 2017 shows that chloride concentrations at both wells has exceeded the allowable ODWS for chloride since the fall of 2014. These wells have exhibited continuous exceedance of the ½ ODWS since 2004.
3. The extended dataset shows that a change in the gradient of the trend line likely started as early as 2010. There were likely not enough data points to December 2012 to be able to skew the projected trend line closer to the year 2026 timeline, which is the result of including the additional data through December 2017.

Figure 6: Town of Orangeville Wells 6 and 11 – Chloride Concentrations, 1999-2017

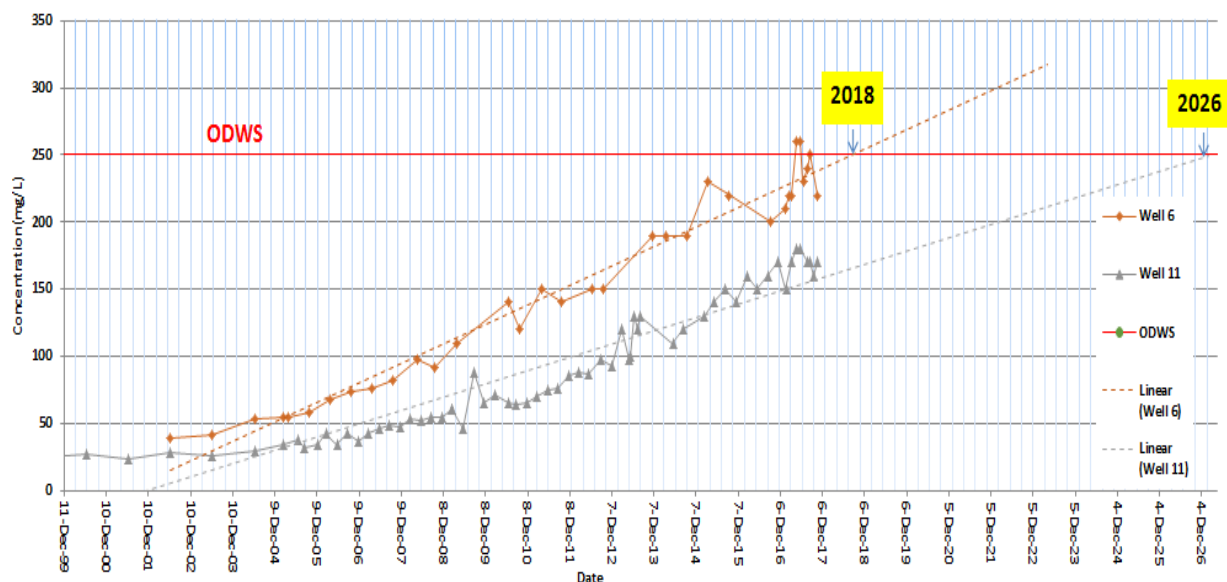


Figure 7: Town of Orangeville Wells 9A and 9B – Chloride Concentrations, 1999-2017

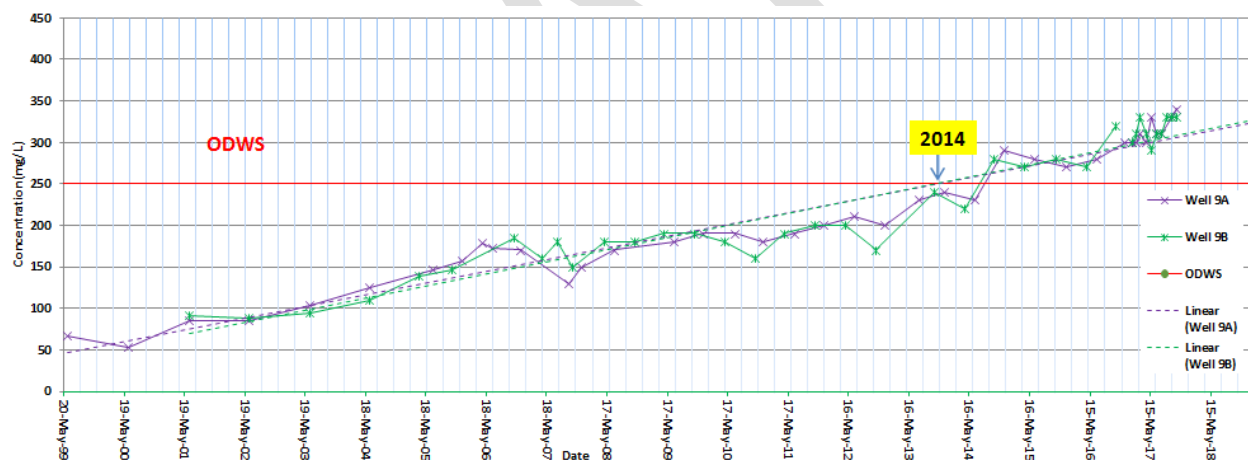
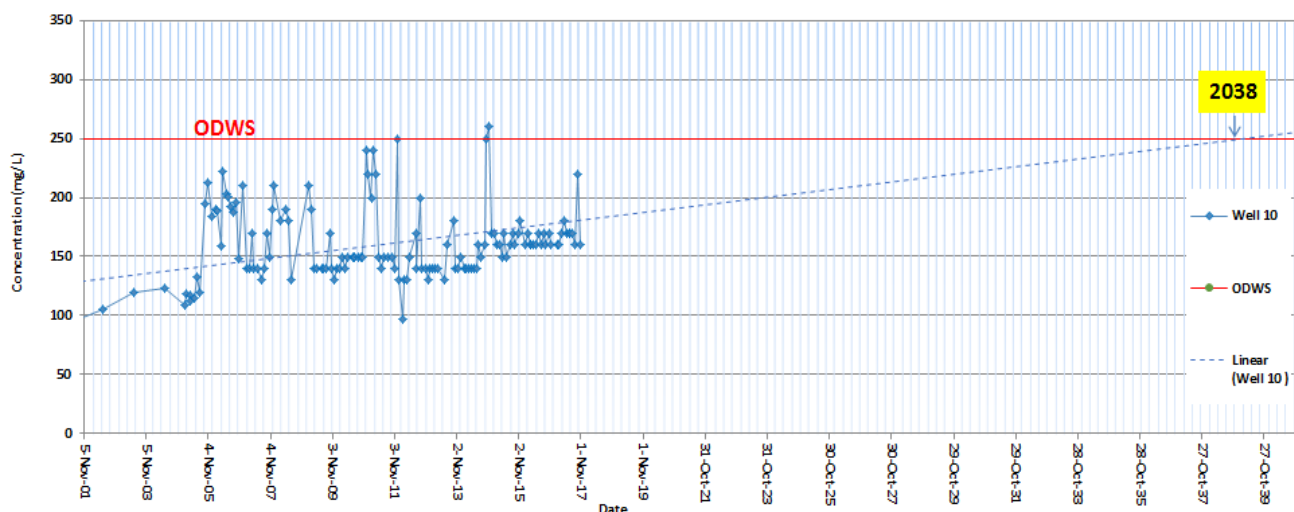


Figure 8: Town of Orangeville Well 10– Chloride Concentrations, 1999-2017



#### 4.2.1.3 Water Quality Monitoring – Halton Region

Per the requirements of Policies SAL-9 and GEN-7, Halton Region undertook an extensive review of raw water quality data at the affected wells where an *issue* has been identified. Two reports were submitted to the Credit Valley Source Protection Authority in May 2018. CVSPA staff undertook an independent review of the data shared with the source protection authority to review and confirm the conclusions outlined in both reports. This review resulted in findings consistent with those reported by Halton Region. The methodology used to assess the raw water quality data was the same as that used in the initial *issue* assessment and is described briefly in Section 4.2.1.2.

##### Nitrate

Nitrate concentrations in raw water from Davidson Wells 1 and 2 were assessed for the period 1985-2017. These results and trend projections are presented in Figures 9 and 10. With the inclusion of the extended dataset to the end of 2017, the timeline for interception with the ODWS has increased for both wells, when compared to the results reported in the CVAR (Table 20).

Table 20: Halton Region (Davidson Wells 1 and 2) – Summary of Projected Exceedances for Nitrate

Review Period	Projected Exceedance of ODWS for Nitrate - Davidson 1	Projected Exceedance of ODWS for Nitrate - Davidson 2
1985 – 2012*	2061	2072
1985 – 2017	2153	2209

\*Based on analyses completed for CVAR Foundation Report “Issues Analyses, Halton Region Wells, September 2013”

Historical water quality data for this wellfield has shown a great deal of variability in nitrate concentrations since 1985. Using the extended dataset to December 2017, nitrate concentrations may meet or exceed the ODWS by 2153 at Well 1 and by 2209 for Well 2. Between 2009 and 2017, a decrease in nitrate concentrations was observed. Given the fluctuations (seasonal and year-to-year) of nitrate concentrations, as well as some exceedances of ½ the maximum acceptable concentration (MAC), it is difficult to draw concrete conclusions about nitrate concentrations trends based on the

available information. When the CVAR was prepared, it was thought that nitrate concentrations are likely influenced by seasonal variation in agricultural practices at locations close to the wells and in areas where a direct hydraulic connection exists between the ground surface and the producing aquifer.

Halton Region is currently working on a study at the Davidson Wellfield with the G360 Institute for Groundwater Research at the University of Guelph to refine the understanding of groundwater flow and potential nitrate sources in this area. The investigation was initiated with the drilling of a new monitoring well adjacent to the Davidson wellhouse in December 2016. Bedrock and groundwater samples collected at varying depths during drilling were analyzed for nitrate concentrations. Downhole geophysical surveys were completed to support the delineation of hydrogeological units and provide a better understanding of groundwater flow through the bedrock aquifer. A multi-level sampling system was designed based on the results of the detailed *in-situ* testing and analysis, and installed in May 2018. It is intended that this in-depth geological and groundwater assessment will help characterize the variability in nitrate concentrations at Davidson Wells 1 and 2.

Figure 9: Halton Region – Davidson Wells 1 and 2 – Nitrate Concentrations, 1985-2017 (Halton Region, 2018a)

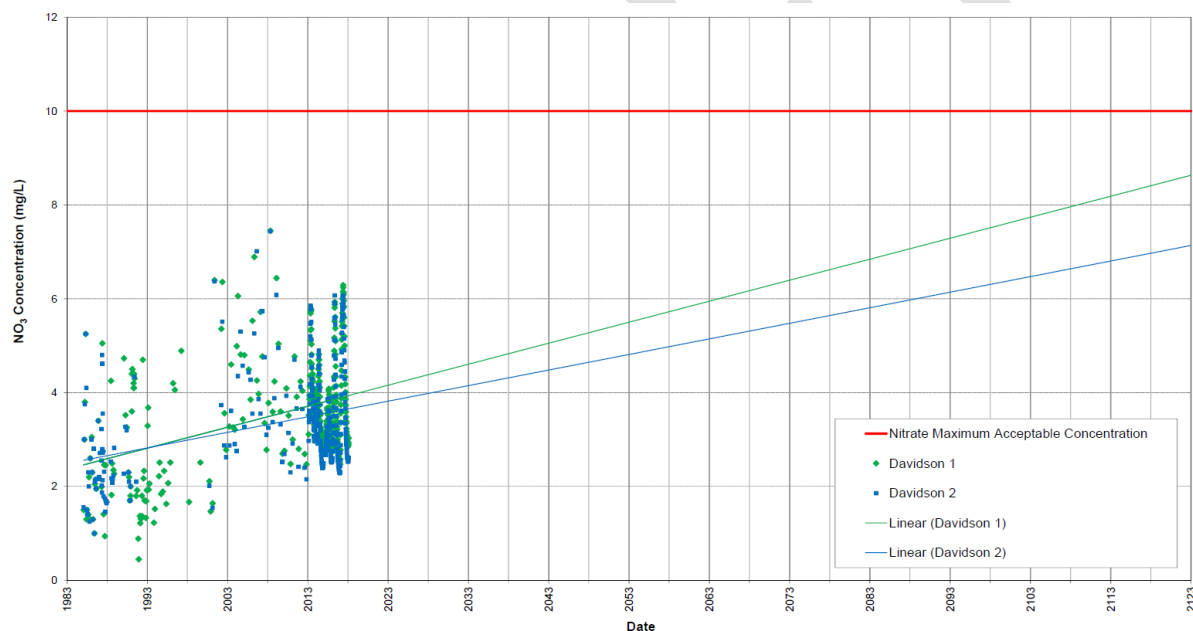
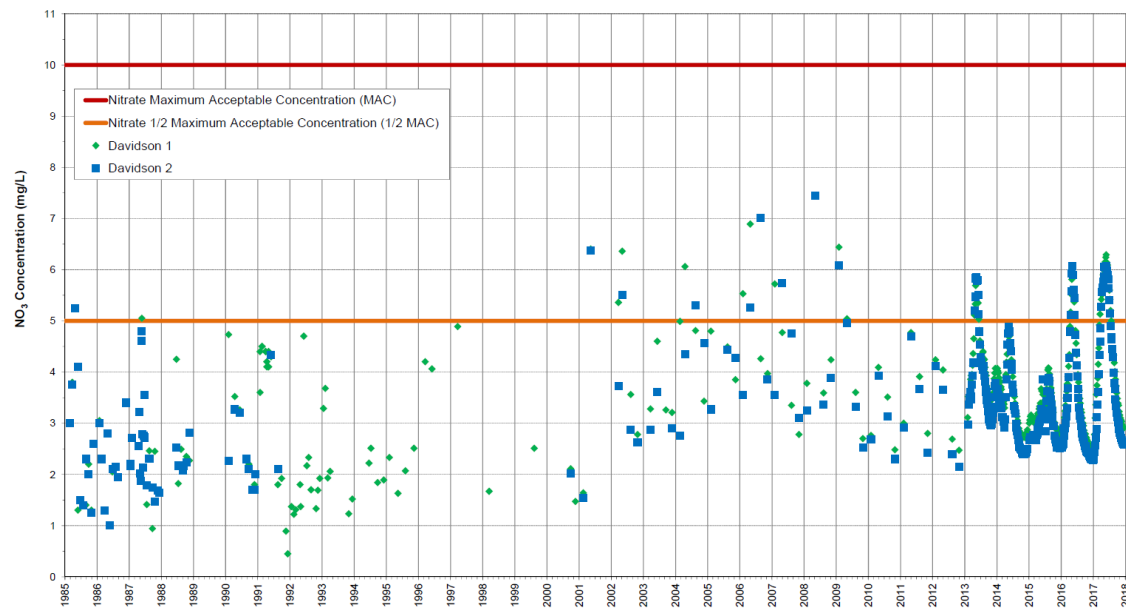


Figure 10: Halton Region – Davidson Wells 1 and 2 – Nitrate Concentrations, 1985-2017 (Halton Region, 2018a)



## Chloride

Chloride concentrations in raw water from Cedarvale Wells 1A, 4 and 4A were assessed for the period 1986-2017. These results and trend projections are presented in Figures 11 and 12. With the inclusion of the extended dataset to 2017, the timeline for the projected exceedance of the ODWS at Cedarvale 1A has increased from the year 2037 to 2055. For the other two municipal wells, the projected date for exceedance of the ODWS has been delayed by six (6) or eight (8) years (Table 21).

Table 21: Halton Region (Cedarvale 1A, 4, and 4A) – Summary of Projected Exceedances for Chloride

Review Period	Projected Exceedance of ODWS for Chloride – Cedarvale 1A	Projected Exceedance of ODWS for Chloride – Cedarvale 4	Projected Exceedance of ODWS for Chloride – Cedarvale 4A
1986 – 2012*	2037	2045	2027
1986 - 2017	2055	2051	2035

\*Based on analyses completed for CVAR Foundation Report "Issues Analyses, Halton Region Wells, September 2013"

Figure 11: Halton Region – Cedarvale Wells 1A, 4 and 4A – Chloride Concentrations, 1986-2017 (Halton Region, 2018b)

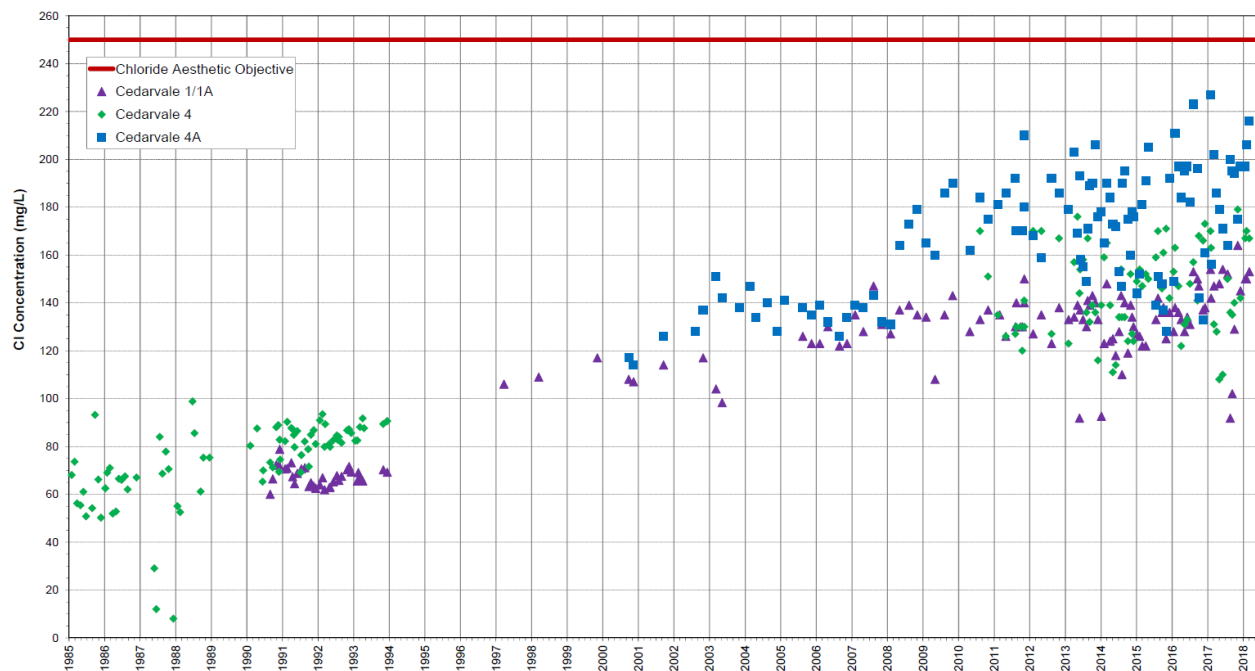
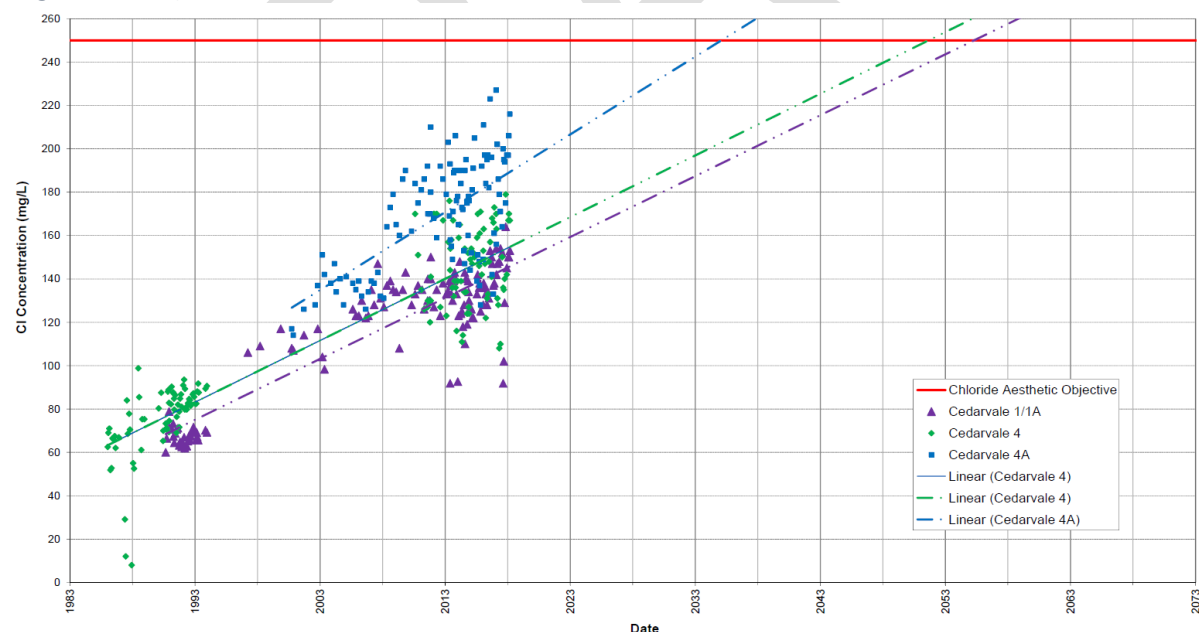


Figure 12: Halton Region – Cedarvale Wells 1A, 4 and 4A – Chloride Concentrations, 1986-2017 (Halton Region, 2018b)



#### 4.2.1.4 Water Quality Monitoring – Peel Region

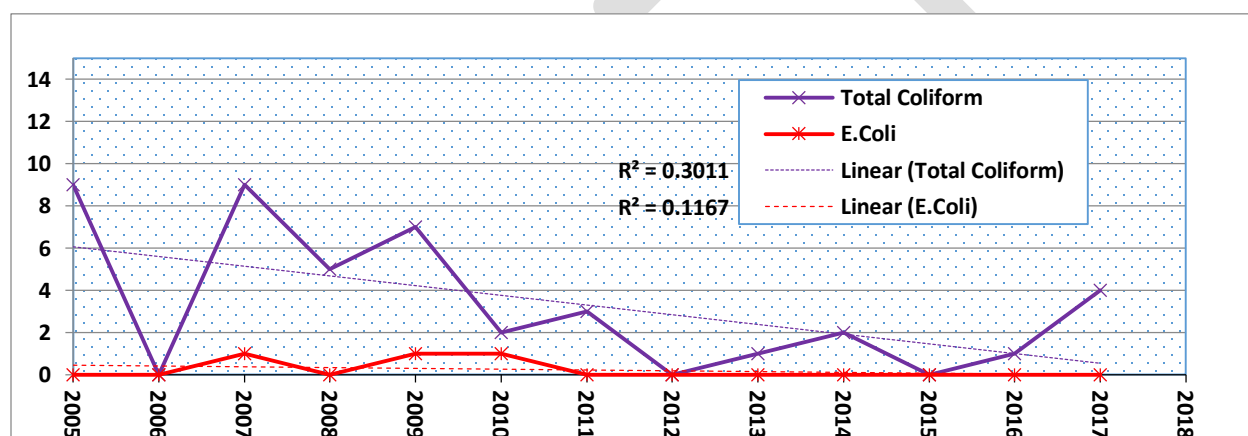
During the November 2017 meeting with Peel Region it was communicated by the municipality the intention to remove Inglewood Well 2 from operation. The municipality drilled a new well in Fall 2015



and plans to bring the well (Inglewood Well 4) on-line in early 2019 once amendments to the CTC Source Protection Plan have been approved by the Ministry of the Environment, Conservation, and Parks. Once Inglewood Well 4 is operational, the municipality intends use Inglewood Well 2 as a back-up source of drinking water for a period of one year. After that time, Inglewood Well 2 will be disconnected from the municipal drinking water system and transferred to private ownership.

To comply with the requirements of Policy GEN-7, Peel Region provided total coliform and *E. coli* data to the Credit Valley Source Protection Authority to assess trends in these parameters since the *issue* designation was assigned to Inglewood Well 2. Figure 13 is a linear graph which shows the cumulative number of exceedances of total coliforms and *E. coli* recorded between 2005 and the end of 2017. Trend analysis of this data was also completed. Based on the analysis, it is apparent that for both parameters, there has been a notable reduction in the instances of exceedance since 2009, although there have been some exceedances in total coliforms in 2017.

Figure 13: Peel Region – Inglewood Well 2 – Pathogen Concentrations, 2005-2017



#### 4.2.1.5 Potential Updates to the CTC Source Protection Plan

Although the results of additional water quality data analyses described above indicate somewhat different water quality trends relative to those identified in the Credit Valley Assessment Report, it was the CTC Source Protection Committee's opinion that it is likely premature to determine whether CTC SPP policies have had any impact on nitrate, sodium, pathogen, and chloride concentrations at municipal wells where an *issue* has been identified. Water quality trends have less uncertainty when longer data records are available for analysis, and therefore, it was agreed by the Committee to delay making any conclusions regarding the effectiveness of policies in the CTC SPP until such time as longer continuous water quality records are available.

Further, as the CTC SPP has only been in effect for two years, policies requiring actions to manage existing significant drinking water threats have not been completely implemented. In particular, risk management plans for existing agricultural and road salt related threats do not have to be in place until December 31, 2020. It was agreed by municipal and source protection authority staff, as well Committee members, that mitigation actions will take time to implement and improvements will not occur immediately. Therefore, the CTC Source Protection Committee agreed that the consideration of new policies to prevent future drinking water threats, as well as the reassessment of the *issue*

designation (Table 22) should be included in the workplan submitted to review and update the CTC Source Protection Plan.

*Table 22: Potential Updates to CTC Source Protection Plan – Environmental Monitoring*

Municipality	Potential Update
Town of Orangeville	Review of ‘Sodium and Chloride Issue’ designations at Orangeville Drinking Water System based on additional water quality monitoring data.
	Consideration of making a formal request to the Director pursuant to Section 119 of the Director’s Technical Rules to designate the Town’s Water Pollution Control Plant (WPCP) outfall as a local threat. To comply with Policy SWG-19 of the CTC Source Protection Plan, the Town has undertaken a research investigation to determine the extent to which the sodium and chloride loading from the Town’s WPCP outfall into WHPA-E for Well 10 influences rising concentrations of these parameters.
Halton Region	Review of ‘Nitrate Issue’ designation at Acton Drinking Water System based on additional water quality monitoring data and research results.
	Review of ‘Chloride Issue’ designation at Georgetown Drinking Water System based on additional water quality monitoring data.

#### 4.2.2 Sodium and Chloride Monitoring (Moderate/Low Threats Related to Road Salt)

The CTC Source Protection Committee chose to include a number of *Specify Action* policies in the CTC SPP where the application of road salt is or could potentially be a low or moderate drinking water threat in recognition that this activity is carried out throughout the source protection region; in addition to the fact that chloride and sodium are mobile chemicals that move easily and rapidly into and through aquifers.

Policy SAL-13 is one of these *Specify Action* policies and is directed at municipalities responsible for the treatment and distribution of municipal drinking water. The policy is non-legally binding. Each implementer must have regard for the policy in making decisions, but also has the flexibility in determining what actions will be taken in implementing the policy. In discussions held among stakeholders at the CTC SPR Implementation Working Group meeting held in May 2018, it was confirmed that given the responsibilities under the *Safe Drinking Water Act, 2002*, municipalities spent considerable effort looking at trends in several water quality parameters. In fact, some municipalities acquire support from the private sector to summarize water quality results and make recommendations where exceedances are recorded. For this reason, it was decided that municipalities requested to implement Policy SAL-13 would have the option of forwarding these water quality results or the summaries of water quality analyses already prepared.

Increasing concentrations of sodium and chloride in surface waterways, lakes, and groundwater aquifers has been a prevalent concern in recent years. The environmental impact of road salt use in Canada has been documented in several studies demonstrating the adverse effects to aquatic life, terrestrial vegetation, and drinking water. The CTC Source Protection Committee has expressed their concerns for increasing sodium and chloride trends in the raw water supplying municipal drinking water systems. At CTC SPC Meeting #3/18 held on September 19, 2018, it was decided that a small Working Group of Committee members, as well as municipal and conservation authority staff would be created to discuss gaps in policies in the CTC Source Protection Plan.

### 4.3 Protecting Water Quantity – Review of Tier 3 Water Budget

Water budgets review each part of a watershed's hydrologic system, and uses data to describe the pathways that water takes through the watershed. This information helps determine how much water is available for human use while ensuring enough is left for natural processes. The *Directors Technical Rules* guide the completion of tiered water budgets designed as a screening mechanism for gaining a progressive understanding of watershed characteristics, surface-groundwater interactions, and the impacts of water takings on municipal drinking water supplies.

The Water Quantity Risk Assessment framework under the *Clean Water Act, 2006* consists of four (Conceptual, Tier 1, Tier 2, and Tier 3) tiers of analysis. The level of investigation in the tiered approach depends on the severity of local water quantity issues. That is, Tier 2 analysis is required only in watersheds with potential stress to water quantity and municipal drinking water systems. The Tier 3 analysis is then only conducted where the Tier 2 results confirm moderate or significant stress. All of the existing and potential future significant drinking water quantity threats identified in the CTC Source Protection Region are threats to groundwater-sourced municipal drinking water supplies. The extent to which water budget analyses were carried out across the CTC Source Protection Region varied (Table 23).

*Table 23: Summary of Water Budget Work Completed Through the Drinking Water Source Protection Program*

Source Protection Area	Water Budget Work
Central Lake Ontario	Conceptual and Tier 1 Water Budgets (PRMS, MODFLOW) York Tier 3 Integrated Water Budget (GSFLOW)
Toronto and Region	Conceptual, Tier 1 / Tier 2 Water Budgets (PRMS, MODFLOW) York Tier 3 Integrated Water Budget (GSFLOW)
Credit Valley	Integrated Tier 2 Water Budget (HSP-F; FEFLOW) Orangeville-Mono-Amaranth Tier 3 Water Budget (HSP-F, MODFLOW) Halton Hills Tier 3 Water Budget (MIKE SHE, FEFLOW)

Precipitation-Runoff Modeling System (PRMS)

Modular Flow (MODFLOW)

Coupled Groundwater and Surface Water Flow (GSFLOW)

Hydrological Simulation Program – Fortran (HSP-F)

Finite Element Flow (FEFLOW)

Numerical models, such as the tools used in the completion of the water budget analyses, are continuously evolving and must be kept current. In recognition of this need for long-term numerical model maintenance, the CTC Source Protection Committee included Policy DEM-8 in the CTC Source Protection Plan. This policy encourages the Ministry of the Environment, Conservation, and Parks to maintain partnerships with source protection authorities, municipalities, and other partners to undertake this maintenance. The Ministry has provided financial support to the CTC Source Protection Region to review the usability of the models generated through the tiered water budget work, recommend best management practices to maintain such models, and harmonize certain facets of the models for use by practitioners.

The CTC Source Protection Region has chosen to rely on the Oak Ridges Moraine Groundwater Program (ORMGP) as custodians for the numerical models in the CTC SPR. The ORMGP is a coalition of thirteen (13) agencies working together to better understand and manage water resources. The Credit Valley, Toronto and Region, and Central Lake Ontario Conservation Authorities are members of this partnership. The Program provides for a multi-agency, collaborative approach to collecting, analyzing, and disseminating water resource knowledge as a basis for effective stewardship of water resources. Through the ORMGP Model Custodianship Program, numerical models are maintained as active tools and are kept up-to-date. In the *Guide for Actively Managing Watershed-Scale Numerical Models in Ontario* (August 2017) prepared by the ORMGP, it is encouraged that agencies commissioning modelling studies put in place practices to effectively manage these numerical models and their associated data sets to facilitate continued application and improvement of the models.

Through discussions with municipalities in the CTC SPR in 2017 and 2018, a number of updates are anticipated to numerical models in the next four to five years. Each of these anticipated updates are outlined in Table 24.

*Table 24: Numerical Model Updates in the CTC Source Protection Region (2019-2023)*

Municipality	Expected
Halton Region	<p>Halton Region is considering an update to the Halton Hills Tier 3 models using the monitoring, testing, and pumping rate data collected since the models were originally completed (2013). Discussions with the Region suggest that the timeline for modelling, peer review, mapping, and reporting would run between 2020 and 2023.</p> <p>Wellhead Protection Area (WHPA) updated delineations, revisions to vulnerability scoring, and water quantity stress assessment would be major components of this work.</p>
Town of Orangeville	<p>In 2004, the Town completed a Long-Term Servicing Strategy (LTSS) to plan for the management of its water supply and sewage treatment needs into the future. The LTSS identified that the existing water supply capacity is insufficient to meet future water supply demands associated with growth expectations. This concern was corroborated in the water budget work completed in the preparation of the Credit Valley Assessment Report.</p> <p>The Town has recently retained a team of consultants to verify additional drinking water supply capacity requirements to service planned growth, complete the necessary environmental assessment required for a new municipal supply well, and run existing numerical models (taking into consideration the new supply well) to acquire updated mapping of vulnerable areas.</p>
Peel Region	<p>The Region of Peel has plans to build a regional-scale numerical model of the groundwater flow system. This work is intended to advance the understanding of groundwater flow in the Region and provide a foundation through which site specific studies can be completed. The work is expected to take place in 2019 through to the first half of 2020.</p> <p>The objectives of this work includes updating the WHPAs for existing wells and planned well Alton 4A, assessing aquifer vulnerability, and vulnerability scoring.</p>
Durham Region	<p>The “Durham Model” was completed in 2010 and was the first numerical model to cover Durham Region in its entirety. Since the Durham Model was completed, a number of groundwater and surface water models have been created, expanded, and modified; the</p>

	<p>majority affiliated with the technical work required to complete the Assessment Reports under the <i>Clean Water Act, 2006</i>.</p> <p>The Durham Model (2010) was capable of being used to refine the Region's Wellhead Protection Areas, although this task was never completed as it was not within the scope of the original study.</p> <p>The Region has chosen to update the Durham Model (2010) to have a more up-to-date Regional Groundwater Model (Durham Model 2019). The objectives of this work includes updating the WHPAs for existing wells, assessing aquifer vulnerability, and vulnerability scoring.</p>
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#### 4.4 Changes in Vulnerable Area Delineations and Vulnerability Scoring

As indicated in Section 4.3, a number of groundwater models will be revised and updated across the CTC Source Protection Region over the next several years. With this in mind, it is expected that, at minimum, the WHPAs associated with a number of municipal groundwater systems may be impacted (Table 25). However, additional WHPAs may be impacted by a Pilot Project currently underway in the Credit Valley Source Protection Area.

When approved by the Minister of the Environment, Conservation, and Parks, the Central Lake Ontario, Credit Valley, and Toronto and Region Assessment Reports identified an information gap related to the *Director's Technical Rules 39 to 41*. These rules reference where groundwater vulnerability scores may be increased as a result of man-made pathways that serve to increase the speed by which a contaminant might reach a source of drinking water. Although some preliminary work to develop a standard methodology to effectively and consistently deal with assessing various anthropogenic pathways was completed prior to submitting the Assessment Reports to the Ministry for final approval, additional work was necessary.

The CTC SPR has initiated a Pilot Project aimed at to further assessment of transport pathways in the Credit Valley Source Protection Area (CVSPA). The end goal of this exercise is to provide municipalities with criteria and parameters through which they can evaluate a potential transport pathway. Each municipality in the CTC SPR would then be using the same, standardized criteria to report to the source protection authority and source protection committee per the requirements under Ontario Regulation 287/07.

It is acknowledged that even with this more in-depth assessment, there will continue to be gaps in the final analysis, particularly since well records and engineering drawings are not readily available for all transport pathways across the CVSPA. Municipalities and provincial stakeholders were asked for GIS files (polygon, polyline, and point) identifying the location of existing transport pathways. These data sets varied across the source protection area. The analysis was performed only as a desktop exercise and field verification was not within the scope of the study.

The Oak Ridges Moraine Groundwater Program has provided support to this Project by identifying the locations and depths of the aquifers supplying municipal groundwater systems in the CVSPA. Using the modeling files generated through the Tier 2 and 3 water budget activities, the transport pathways with

the potential to directly impact the aquifers supplying water to a municipal drinking water system will be identified.

Once the methodology and results for the CVSPA have been endorsed by the CTC SPR municipalities and the CTC Source Protection Committee, the scope of this work will move to the Central Lake Ontario and Toronto and Region Source Protection Areas.

*Table 25: Municipal Groundwater Drinking Water Systems with WHPAs which could change in the CTC SPR*

Source Protection Area	Upper Tier Municipality	Lower Tier Municipality (Water System)
Credit Valley	Dufferin County	Mono (Island Lake)
		Mono (Coles)
		Mono (Cardinal Woods)
		Amaranth (Amaranth-Pullen)
		Orangeville (Orangeville)
	Halton Region	Halton Hills (Acton)
		Halton Hills (Georgetown)
	Peel Region	Caledon (Alton, Caledon Village)
		Caledon (Cheltenham)
		Caledon (Inglewood)
Toronto and Region	Peel Region	Caledon (Caledon East)
		Caledon (Palgrave)
	Durham Region	Uxbridge (Uxville Well)

#### 4.5 Climate Change Considerations

The *Director's Technical Rules* allow for the consideration of climate change impacts, however, there is currently no clear direction on how to complete this assessment. The MECP, Conservation Ontario, and the Ontario Climate Consortium have initiated a collaboration to develop scientifically-based guidance on how to incorporate climate change into the drinking water quality risk assessment outlined in the *Director's Technical Rules*. Part of this initiative is to develop a practical *Assessment Tool* which will accompany the guidance.

The results of this Project may lead to amendments being made to the *Director's Technical Rules* which would then allow source protection authorities and municipalities to evaluate the impact of climate change at municipal drinking water systems consistently while taking local conditions under consideration in the completion of the assessment.

#### 4.6 Lake Ontario Science

The *Director's Technical Rules* provided for the use of an event-based modelling approach as a tool to identify activities that could be significant threats to drinking water supplies drawing water from the Great Lakes. Any modelled activity which exceeds the threshold established by the local Source Protection Committee is deemed to be a significant threat. Each modelled threat activity deemed as significant has its own event-based area (EBAs) on land and is associated with one or more drinking water intakes. In the CTC Source Protection Region, spills from petrochemical pipelines, wastewater



treatment plants, sewage pipes, bulk fuel storage, and nuclear power stations were all evaluated as potential significant drinking water threats using event-based modelling. There are policies in the CTC Source Protection Plan to address these significant drinking water threats from existing and future threat activities within these EBAs.

When the event-based modeling of potential spills was carried out under the Lake Ontario Collaborative, a number of criteria were put in place:

- Data was modified from actual events to be applicable to Lake Ontario;
- Extreme weather events were not used, but rather, regular climatic conditions were assumed; and
- No risk management measures were considered to be in place.

Policy LO-G-2 encourages the Ministry of the Environment, Conservation, and Parks to work in partnership with Environment and Climate Change Canada and the municipalities responsible for providing water from systems with intakes in the western basin of Lake Ontario to establish a Lake Ontario Collaborative Group (LOCG). The LOCG was established in March 2017 with a formal Terms of Reference defining roles, tasks, and responsibilities of the various partners. The main purpose of the LOCG is to undertake actions to support the implementation of policies in the CTC Source Protection Plan which have been put in place to protect Lake Ontario.

Although the workplan for the LOCG has yet to be finalized, Clause 3 of Policy LO-G-2 specifies the use of either the 3-Dimensional Hydrodynamic Circulation Model (developed by the Lake Ontario Collaborative) or more advanced models, as appropriate, to further assess potential drinking water threats. In particular, these potential drinking water threats could include new proposed activities, activities for which spill scenario modelling has not yet been completed, and those created as a result of climate change. Therefore, a proposed CTC Source Protection Plan update is carrying out additional modeling scenarios (i.e., spill from a ship, consideration of extreme weather events).

## 5.0 Proposed Review and Updates to CTC Source Protection Plan

Consultation with municipal stakeholders as well as preliminary assessment following the guidance released by the Source Protection Programs Branch suggests a number of updates to the CTC Source Protection Plan will be necessary or should be considered. The rationale, timeframe, anticipated consultation, whether the update will affect the assessment report or the source protection plan, and financial considerations for each task is outlined in Tables 26 and 27.

Table 26: Proposed Review and Updates to CTC Source Protection Plan - Policy Related

Update	Description of Proposed Review and Update	Applicable Document	Timeline	Consultation	Financial Responsibility for Update
1	Consider update to DNAP-1 and DNAP-2 policies to include the addition of exception for small quantities.	CTC SPP, ED	April 2019 – March 2021	Implementing Bodies (municipalities, Risk Management Official, MECP, OMAFRA, pipeline owners), CTC SPC	CTC SPR through Program Maintenance Funding
2	Review of agricultural source material policies (ASM-2, ASM-4) for gaps related to allowing a risk management plan (RMP) when a Nutrient Management Plan (NMP)/Strategy (NMS) is required, but has expired; or when a Nutrient Management Plan is voluntarily in place.				
3	Review of Policies ASM-1 and ASM-2: in particular duplication of requirements where NMP/NMS in place on a property where a risk management plan (RMP) is also required (i.e., soil testing).				
4	Review of the need for prohibiting the application of commercial fertilizer in Wellhead Protection Area-A.				
5	Consider changing implementation body in Lake Ontario policies.				
6	Consider addition to Policy LO-NGS-1 requiring that Ontario Power Generation designate an appropriate lead for source protection considerations.				
7	Consider the transportation of substances as a local threat. If deemed a local threat, create a specify action policy to address the this threat.	CVAR, TRAR, CLOAR, CTC SPP, ED	April 2020 – March 2022	Anticipated pre-consultation on potential policy implications, 35-day public consultation period	
8	Create policy to require signage at boundaries of most vulnerable areas (i.e., WHPA-A).	SPP, ED	April 2019 – March 2021		
9	Consider the creation of a policy or policies to address transport pathways.		April 2023 – March 2024		
10	Consider the need for new source protection plan policies to prevent future drinking water threats.		April 2020 – March 2022		
11	Re-evaluate the appropriateness of a risk management plan approach for all agricultural policies currently requiring prohibition outside of the WHPA-A.		April 2020- March 2022		
12	Review need for new policies as a result of adding liquid hydrocarbon pipelines as a prescribed threat.				

Table 27: Proposed Review and Updates to CTC Source Protection Plan - Technical Related

Update	Description of Proposed Review and Update	Applicable Document	Timeline	Consultation*	Financial Responsibility for Update
13	Review of 'Nitrate Issue' designation at Acton Drinking Water System based on additional water quality monitoring data and research results.	CVAR	March – June 2024	Halton Region, CVSPA, CTC SPC, MECP	Halton Region
14	Review of 'Chloride Issue' designation at Georgetown Drinking Water System based on additional water quality monitoring data.	CVAR			Halton Region
15	Review of 'Sodium and Chloride Issue' designations at Orangeville Drinking Water System based on additional water quality monitoring data.	CVAR		Town of Orangeville, CVSPA, CTC SPC, MECP	Town of Orangeville
16	Group all significant groundwater recharge areas (SGRA) polygons previously scored 2,4,6 into one area with no score. Revision to map in each Assessment Report.	CVAR, TRAR, CLOAR	April 2019- March 2020	Municipalities, SPAs, CTC SPC, MECP	CTC SPR through Program Maintenance Funding
17	Update Assessment Reports to reflect the new prescribed significant threat per <i>Clean Water Act, 2006</i> (O. Reg. 287/07) - liquid hydrocarbon pipeline.		April 2020 – March 2022	Pipeline Owners, Municipalities, CTC SPC, MECP	
18	Incorporation of climate change considerations based on direction from the Source Protection Programs Branch.			Municipalities, MECP, SPAs, CTC SPC	
19	Incorporate updated conceptual and groundwater model (Durham Region) results from numerical modeling into Water Budget Chapters.	CLOAR, TRAR	January 2019- March 2021	Durham Region, Township of Uxbridge, MECP, SPAs, CTC SPC, landowners	Durham Region
20	Revise WHPA delineations for Uxville Drinking Water System as a result of model refinement and update.	TRAR			
21	Incorporate updated modeling (Peel Region) results into Water Budget Chapters (including conceptual model update, groundwater model, surface water model, and modelling scenarios).	CVAR, TRAR		Peel Region, Town of Caledon, MECP, SPAs, CTC SPC, landowners	Peel Region
22	Evaluate water quantity stress at subwatershed 13 and need for Tier 3 assessment.	CVAR			
23	Revise WHPA delineations for Peel Region Drinking Water Systems as a result of model refinement and update.	TRAR, CVAR			

Update	Description of Proposed Review and Update	Applicable Document	Timeline	Consultation*	Financial Responsibility for Update
24	Incorporate updated water budget and stress assessment (Halton Region) results into Water Budget Chapter (including conceptual model update, groundwater model, surface water model, and modelling scenarios).	CVAR	January 2020 – December 2023	Halton Region, Town of Halton Hills, MECP, SPAs, CTC SPC, landowners	Halton Region
25	Revise WHPA delineations for Georgetown and Acton Drinking Water Systems in Chapter 4 as a result of model refinement and update.	CVAR			
26	Incorporate updated water budget and stress assessment (Orangeville) results into Water Budget Chapter (including conceptual model update, groundwater model, surface water model, and modelling scenarios).	CVAR	September 2018 – March 2020	Town of Orangeville, MECP, SPAs, CTC SPC, landowners	Town of Orangeville
27	Revise WHPA delineations for Orangeville Drinking Water System in Chapter 4 as a result of model refinement and update.	CVAR			
28	Identify new and existing transport pathways based on in-depth inventory in all three source protection areas.	CVAR, TRAR, CLOAR	April 2019 – March 2020	Municipalities, SPAs, CTC SPC, MECP	CTC SPR through Program Maintenance Funding
29	Updates to threat enumeration summaries.		April 2019- March 2024		
30	Updates to content of Watershed Characterization Chapters.				
31	Assess effects of risk management measures on spill scenarios conducted through event-based modeling.		April 2021- March 2024		Durham Region, City of Toronto, Peel Region
32	Consideration of additional modeling scenarios (i.e., spill from a ship, consideration of extreme weather events) for inclusion in CTC SPP.				

\* Anticipated pre-consultation on potential technical amendments, 35-day public consultation period.

## 6.0 Project Management and MECP Support for Updates

The Ministry of the Environment, Conservation, and Parks has provided financial support, as well as technical and policy expertise, in the completion of the CTC Source Protection Plan. Core staff representing the CTC Source Protection Region will manage and coordinate the updates outlined in Section 5.0 including ensuring that the appropriate municipalities, provincial ministries, landowners, and other implementing bodies are consulted appropriately on amendments. Credit Valley, Toronto and Region, and Central Lake Ontario conservation authority staff will provide local expertise and support the work of CTC SPR staff. It is anticipated that current staffing (i.e., 2018-2019 fiscal year) levels can manage the work proposed in this workplan.

The proposed updates to this workplan will be contingent on continued financial support from the MECP and access to expertise within the Source Protection Programs Branch through December 2024.

## 7.0 References

Ministry of the Environment, Conservation, and Parks. 2016. Source Protection Plan Bulletin – Overview of Requirements for Assessment Report and Source Protection Plan Amendments under Section 36 of the *Clean Water Act, 2006*.

Ministry of the Environment, Conservation, and Parks. 2017. Source Protection Plan Bulletin – Overview of Requirements for Assessment Report and Source Protection Plan Amendments under Section 36 of the *Clean Water Act, 2006* (Supplementary Information – Municipal Engagement).

Ministry of the Environment, Conservation, and Parks. 2018. Source Protection Plan Bulletin – Overview of Requirements for Assessment Report and Source Protection Plan Amendments under Section 36 of the *Clean Water Act, 2006* (Supplementary Information – Prohibition of Agricultural Activities Outside WHPA-A or IPZ-1).

Ministry of the Environment, Conservation, and Parks. 2018. Source Protection Plan Bulletin – Overview of Requirements for Assessment Report and Source Protection Plan Amendments under Section 36 of the *Clean Water Act, 2006* (Updates to Director's Technical Rules and Tables of Drinking Water Threats).

Ministry of Municipal Affairs. 2017. Growth Plan for the Greater Golden Horseshoe. Accessed at: <http://placestogrow.ca/images/pdfs/ggh2017/en/growth%20plan%20%282017%29.pdf>

Regional Municipality of Halton. 2018a. Davidson Wellfield Nitrate Concentration Data Review. 15 pages.

Regional Municipality of Halton. 2018b. Cedarvale Wellfield Chloride Concentration Data Review. 14 pages.

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ENV1283MC-2012-3028

JUL 28 2015

Mr. Nando Iannicca  
Credit Valley SPA Chair  
1255 Old Derry Rd.  
Mississauga, Ontario  
L5N 6R4

Ms. Maria Augimeri  
Toronto and Region SPA Chair  
5 Shoreham Drive  
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M3N 1S4

Ms. Susan Self  
CTC Source Protection Committee Chair  
42 Balsam Street N.  
Uxbridge, Ontario  
L9P 1B3

Mr. Don Mitchell  
Central Lake Ontario SPA Chair  
100 Whiting Avenue  
Oshawa, Ontario  
L1H 3T3

Dear Mr. Iannicca, Ms. Augimeri, Mr. Mitchell, and Ms. Self:

It is a pleasure to inform you that the review of the source protection plans, developed under the Clean Water Act, 2006, for the Central Lake Ontario, Toronto Region and Credit Valley source protection areas within the CTC source protection region has been completed. Pursuant to section 29 of the Clean Water Act, I approve the plans for the Central Lake Ontario, Toronto Region and Credit Valley source protection areas.

I appreciate the efforts undertaken by the CTC source protection committee and authority and all stakeholders to assess and develop plans to protect drinking water sources in your community. Thank you for all your hard work, leadership and commitment.

Your community is to be commended on the achievement of this important milestone. This is an example of the local, inclusive, community-based approach to protecting source water envisioned by the Clean Water Act. The province has been pleased to support the development of the Central Lake Ontario, Toronto Region and Credit Valley source protection plans with an investment of \$24,653,954 since 2004. An additional \$1,300,020 was provided within the CTC source protection region for various projects under the Ontario Drinking Water Stewardship Program to landowners, municipalities and the conservation authority to take action to protect drinking water.



Following today's approval of the plans, in order to allow time to prepare for implementation, the Central Lake Ontario, Toronto Region and Credit Valley source protection plans will take effect on December 31, 2015. Please ensure that this date is clearly stated in the plans.

Under section 36 of the Clean Water Act, when a source protection plan is approved, an order must also be given that governs the review of the plan. Pursuant to clauses 36 (1) (c) and (d), and as an initial step in the development of detailed requirements that will govern the plans' review, the Toronto and Region source protection authority shall prepare and submit a workplan to the ministry. The workplan shall propose the detailed steps for the review of the plans, including which portions of the plans are to be reviewed, the timeframes for each step of the review and the consultation that would be undertaken as part of the review, and rationale for each step. A summary of how the workplan was developed shall also be included. The workplan shall be developed in consultation with the CTC source protection committee, participating municipalities of the CTC source protection region, and the Ministry of Environment and Climate Change.

The development of the workplan must take into consideration any experience that has been gained from implementing the source protection plans and information from the first annual progress reports on plan implementation (due May 2018). Accordingly, the workplan shall be submitted to the ministry no later than November 30, 2018. Once the workplan is submitted and reviewed by the ministry, and following any further consultation that the ministry considers advisable, a further order can be issued under section 36 that specifies more detailed requirements outlining the content and timeframes that will govern the review of the plans for the Central Lake Ontario, Toronto Region and Credit Valley source protection areas.

The committee has included a number of policies in the plans that request the province create or modify programs, or introduce new legislation. The ministry very much appreciates the advice of the source protection committee on how it may protect drinking water sources. The ministry will conduct an analysis on how to best achieve the policy objectives. The results of this analysis will be communicated to the Toronto and Region source protection authority when the ministry reports on its implementation of policies in the plans.

The plan includes a comprehensive set of policies to address activities that contribute to elevated sodium and chloride in the groundwater in Orangeville and Georgetown. In addition to on-the-ground actions such as the establishment of risk management plans, there is a policy asking the province to implement a provincial licensing and accreditation program for those applying road salt. There is also a policy that directs municipalities and the source protection authority to investigate the sources of sodium and chloride that contribute to the drinking water issue and to sample the raw water supply of the affected drinking water systems monthly.

Mr. Iannicca, Ms. Augimeri, Mr. Mitchell, and Ms. Self  
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I look forward to seeing the progress made towards addressing the local sodium and chloride issues in your first annual progress report in 2018, and the opportunity to continue working with you and other groups to strengthen our actions in reducing sodium and chloride impacts from the application of road salt. Before the province considers a new licensing and accreditation program for road salt application, we would like to see whether the implementation of the other policies reduces the concentrations of sodium and chloride in the aquifers in Orangeville and Georgetown.

I would also like to acknowledge the committee's supplementary recommendations on the future of the program, submitted December 19, 2014. These recommendations, along with annual reports on the implementation of source protection plans, will help us plan the path forward for drinking water source protection. With your commitment, significant progress has been made in source protection and the Province looks forward to continuing to work with you and all stakeholders to protect drinking water.

Once again, thank you for your work to protect Ontario's source waters, and please accept my best wishes.

Sincerely,



Glen Murray  
Minister

c: Sue Lo, Assistant Deputy Minister, DWMD, Ministry of the Environment and Climate Change  
Ling Mark, Director, SPPB, Ministry of the Environment and Climate Change  
Beverley Thorpe, Project Manager, CTC Source Protection Region

CTC Source Protection Plan Policy Implementation - January 2016 - December 2017		Policy ID	Description	Implementing Body #1	Implementing Body #2	Existing -Timeline	Future - Timeline	Other Timeline
GENERAL POLICIES								
10 Policies	GEN-1	s.59 Restricted Land Uses	Municipality	RMO	5 yrs + 3 yrs	Immediately		
	GEN-2	Specify Action - Prioritization	Municipality		N/A	N/A	Once every 5 yrs	
	GEN-3	Specify Action - Prioritization	Provincial Ministry		N/A	N/A	3 yrs (new/amended instrument); 5 years after	
	GEN-4	Incentive	MOECC		2 yrs	N/A		
	GEN-5	Incentive	Municipality		2 yrs	N/A		
	GEN-6	Specify Action - Funding - Local Research	MOECC		2 yrs	N/A		
	GEN-7	Specify Action - Share Data	Municipality		2 yrs	N/A		
	GEN-8	Specify Action - E & O - M/L Threats	Municipality		2 yrs	N/A		
	GEN-9	Specify Action - Incorporate SPP	Niagara Escarpment Commission		2 yrs	N/A		
WASTE POLICIES								
12 Policies	WST-1	Part IV - Storage of Hazardous or Liquid Industrial Wastes (RMPs)	RMO	MOECC	1 yr + 5 yrs	Immediately		
	WST-2	E & O - Storage of wastes - (p), (q), (r), (s), (t), or (u)	Municipality		2 yrs			
	WST-3	PI - Application of Untreated Septage to Land	MOECC		Upon Expiry; 5 yrs	Immediately		
	WST-4	PI - Handling and Storage of various wastes	MOECC		3 yrs	Immediately		
	WST-5	LUP - Handling and Storage of various wastes	Planning Approval Authority		N/A	Immediately		
	WST-6	Part IV - PCB Waste Storage (s. 57, s. 58)	RMO		1 yr + 5 yrs	Immediately		
	WST-7	PI - PCB Waste Storage	MOECC		3 yrs	Immediately		
SEWAGE POLICIES								
24 Policies	SWG-1	Specify Action - Septic Systems - Inspection Program	Municipality	Municipality	Jan. 2017	N/A		
	SWG-2	E & O - Septic Systems	MOECC		2 yrs			
	SWG-3	LUP - Vacant Lots of Record - Septic Systems	Planning Approval Authority		N/A	Immediately		
	SWG-4	LUP - New Lots - Septic Systems	Planning Approval Authority		N/A	Immediately		
	SWG-5	Specify Action - Amend Building Code Act	MMAH		N/A	Immediately		
	SWG-6	Specify Action - Municipal Sanitary Sewer By-Law	Municipality		2 yrs			
	SWG-7	Specify Action - E & O - OWRA Septic Systems	Municipality	SPA	2 yrs	N/A		
	SWG-8	PI - Septic Systems - OWRA	MOECC		3 yrs	Immediately		
	SWG-9	LUP - Septic Systems - OWRA	Planning Approval Authority		N/A	Immediately		
	SWG-10	Specify Action - Septic Systems - OWRA - Guidelines	MOECC		2 yrs			
	SWG-11	PI - Stormwater Management Facility	MOECC		3 yrs	Immediately		
	SWG-12	LUP - Stormwater Management Facility	Planning Approval Authority		N/A	Immediately		
	SWG-13	PI - Sanitary Sewers and Related Pipes	MOECC		3 yrs	Immediately		
	SWG-14	LUP - Sanitary Sewers and Related Pipes	Planning Approval Authority		N/A	Immediately		
	SWG-15	PI - Storage of Sewage	MOECC		3 yrs	Immediately		
	SWG-16	LUP - Storage of Sewage	Planning Approval Authority		N/A	Immediately		
	SWG-17	PI - CSO, STP By-Pass, Industrial Effluent Discharge, STP Effluent Discharge	MOECC		3 yrs	Immediately		
	SWG-18	LUP - CSO, STP By-Pass, Industrial Effluent Discharge, STP Effluent Discharge	Planning Approval Authority		N/A	Immediately		
	SWG-19	Research	Town of Orangeville	CVSPA	2 yrs	N/A		
APPLICATION, MANAGEMENT, STORAGE & HANDLING OF AGRICULTURAL STORAGE MATERIAL								
12 Policies	ASM-1	PI - Application of ASM to Land	OMAFRA		Upon Expiry or within 5 yrs, 3 yrs	Immediately		
	ASM-2	Part IV - Prohibition - WHPA-A, WHPA-B (VS=10) in an ICA, WHPA- E (ICA)	RMO		180 Days	Immediately		
	ASM-3	Part IV - RMP	RMO		1 yr/5 yrs	Immediately		
	ASM-4	PI - Storage of ASM	OMAFRA		3 yrs	Immediately		
	ASM-5	Part IV - RMP, Prohibition	RMO		1 yr/5 yrs	Immediately		
		PI - Mgmt of ASM (Aquaculture)	MOECC		Upon Expiry or within 5 yrs	Immediately		
APPLICATION, STORAGE & HANDLING OF NON-AGRICULTURAL STORAGE MATERIAL								
12 Policies	NASM-1	Application - Part IV - Prohibition - WHPA-A	RMO		180 days	Immediately		
		Application - Part IV - RMP - WHPA - B, WHPA-E, ICA (nitrates)	RMO		1 yr/ 5 yrs	Immediately		
	NASM-2	S & H - Part IV - Prohibition - WHPA-A	RMO		N/A	Immediately		
		S & H - Part IV - RMP - WHPA - B, WHPA-E, ICA (nitrates)	RMO		1 yr/ 5 yrs	Immediately		
	NASM-3	Application - PI - Prohibited in future, existing until expiry	OMAFRA	MOECC	Upon Expiry, Within 5 years	Immediately		
	NASM-4	S & H - PI - Prohibited in future, existing until expiry	OMAFRA	MOECC	Upon Expiry, Within 5 years	Immediately		
	NASM-5	Application, S & H - E & O	OMAFRA	MOECC	2 yrs			
LIVESTOCK GRAZING, PASTURING, AND OUTDOOR CONFINEMENT								
10 Policies	LIV-1	Part IV - Prohibition - WHPA-A	RMO		180 days	Immediately		
		Part IV - Management - RMP - WHPA-A (not in ICA for N or P, WHPA-A, B,E, rest of ICA	RMO		1 yr / 5 yrs	Immediately		
	LIV-2	PI - Prohibit - WHPA A, WHPA - B (ICA), WHPA-E (ICA)	OMAFRA		N/A	Immediately		
		PI - Manage - WHPA-A, WHPA-B, WHPA-E, rest of ICA	OMAFRA		3 years	Immediately		
	LIV-3	Part IV - Prohibition - WHPA-A, WHPA-B (ICA), WHPA-E (ICA)	RMO		N/A	Immediately		
		Part IV - Management - WHPA - A, WHPA-B, WHPA-E	RMO	1 yr / 5 yrs	Immediately			
APPLICATION, STORAGE & HANDLING OF COMMERCIAL FERTILIZER								
12 Policies	FER-1	PI - Prohibit - WHPA A, WHPA-E (ICA)	OMAFRA		Upon Expiry, Within 5 years	Immediately		
		PI - Manage - WHPA-A, WHPA-B, WHPA-E, rest of ICA	OMAFRA		3 years	Immediately		
	FER-2	Part IV - Prohibition - WHPA-A, WHPA-E (ICA)	RMO		180 Days	Immediately		
		Part IV - Management - WHPA-B, WHPA-E, rest of ICA	RMO		1 yr/5 yrs	Immediately		
	FER-3	Part IV - Prohibition - WHPA-A	RMO		N/A	Immediately		
		Part IV - Management - WHPA-A, WHPA-B, WHPA-E, rest of ICA	RMO		1 yr/5 yrs	Immediately		
	FER-4	Education and Outreach	Municipality	MOECC	2 yrs			

All Policies			
	Implemented	143	87%
	In Progress	21	13%
	No Progress	1	1%

TOTAL 165 Policies

Moderate/Low Threat Policies			
	Implemented	1	17%
	In Progress	5	83%
	No Progress	0	0%

TOTAL 6 Policies

Significant Threat Policies			
	Implemented	134	90%
	In Progress	14	9%
	No Progress	1	1%

TOTAL 149 Policies

General Policies			
	Implemented	8	80%
	In Progress	2	20%
	No Progress	0	0%

TOTAL 10 Policies

APPLICATION, STORAGE & HANDLING OF PESTICIDE							
7 Policies	PES-1	Part IV - Management - WHPA-A, WHPA-B, WHPA-E	RMO		1 yr/5 yrs	Immediately	
	PES-2	Part IV - Prohibition - WHPA - A	RMO		N/A	Immediately	
		Part IV - Management - WHPA - A, WHPA-B, WHPA-E	RMO		1 yr/5 yrs	Immediately	
	PES-3	Education and Outreach	MOECC		2 yrs		
	PES-4	Incentive	Municipality		2 yrs		
APPLICATION, STORAGE & HANDLING OF ROAD SALT							
17 Policies	SAL-1	Application - Part IV - Management - WHPA-A, B, E, ICA - Parking Lots, Unassumed Roads	RMO	MOECC Municipality	1 yr/5 yrs	Immediately	
	SAL-2	Application - Part IV - Management - WHPA-A, B, E, ICA - Public Roads	RMO		1 yr/5 yrs	Immediately	
	SAL-3	Application - LUP	Planning Approval Authority		N/A	Immediately	
	SAL-4	Application - Specify Action - Promote BMPs	MOECC		2 yrs		
	SAL-5	Application - Specify Action - Licensing and Accreditation Program	MOECC		2 yrs		
	SAL-6	Application - Specify Action - Update SMP, alternative products, etc.	MTO		2 yrs		
	SAL-7	H & S - Part IV - Prohibition - WHPA - A, B, E, ICA	RMO		N/A	Immediately	
		H & S - Part IV - Management - WHPA - A, B, E, ICA	RMO		1 yr/5 yrs	Immediately	
	SAL-8	Application / H & S - Education & Outreach	Municipality		2 yrs		
	SAL-9	Water Quality Monitoring	SPA		2 yrs		
	SAL-10	Application - LUP - Moderate/Low Threats	Planning Approval Authority		N/A	Immediately	
	SAL-11	Application - Specify Action - Moderate/Low Threats - Promote Best Management Practices	MOECC		2 yrs		
	SAL-12	Application - Specify Action - Moderate/Low Threats - Salt Management Plan	Municipality		2 yrs		
	SAL-13	Application / H & S - Moderate/Low Threats - Monitoring under SDWA	SPA		2 yrs		
STORAGE OF SNOW							
3 Policies	SNO-1	Part IV - Prohibit - WHPA-A, B, E, rest of ICA	RMO		180 Days	Immediately	
		Part IV - Manage - WHPA-B, E, rest of ICA	RMO		1 yr/5 yrs	N/A	
HANDLING AND STORAGE OF FUEL							
9 Policies	FUEL-1	PI - Drinking Water Licences at Municipal Wellheads - WHPA - A, B, E	MOECC	MOECC, TSSA TSSA, MGCS	3 yrs	Immediately	
	FUEL-2	PI - H & S - Aggregate Extraction Site - WHPA - A, B, E	MNRFP		N/A	Immediately	
		PI - H & S - Aggregate Extraction Site - WHPA - A, B, E	MNRFP		3 yrs	N/A	
	FUEL - 3	Part IV - Prohibition - non-residential properties, small businesses, etc. - WHPA - A, B, E	RMO		N/A	Immediately	
		Part IV - Management - non-residential properties, small businesses, etc. - WHPA - A, B, E	RMO		1 yr/5 yrs	N/A	
		Acquire Inspection Reports, Share with RMO, Inform TSSA of Leaks	SPA		180 days	N/A	
	FUEL - 4	Education and Outreach - WHPA-A, B, E	Municipality		2 yrs		
		Education and Outreach - Spill Info, Fuel Suppliers, Colleges	MOECC		2 yrs		
HANDLING AND STORAGE OF DENSE NON-AQUEOUS PHASE LIQUIDS							
4 Policies	DNAP-1	Part IV - Prohibition - WHPA - A, B, C, E	RMO	MOECC	N/A	Immediately	
		Part IV - Management - WHPA - A, B, C, E	RMO		1 yr/5 yrs	N/A	
	DNAP-2	Education and Outreach - Personal Use, ICI - BMPs, Pollution Prevention	Municipality		2 yrs		
	DNAP-3	Specify Action - Moderate/Low Threats - WHPA-D, E; HVA, SGRAs	Municipality		2 yrs		
HANDLING AND STORAGE OF ORGANIC SOLVENTS							
4 Policies	OS-1	Part IV - Prohibition - WHPA - A, B, E	RMO	MOECC	N/A	Immediately	
		Part IV - Management - WHPA - A, B, E	RMO		1 yr/5 yrs	N/A	
	OS-2	Education and Outreach - Personal Use, ICI - BMPs, Pollution Prevention	Municipality		2 yrs		
	OS-3	Specify Action - Moderate/Low Threats - WHPA-B, C, D, E; HVA, SGRAs	Municipality		2 yrs		
MANAGEMENT OF RUNOFF THAT CONTAINS CHEMICALS USED IN THE DE-ICING OF AIRCRAFT							
3 Policies	DI-1	Part IV - Management - WHPA-A, B, E	RMO		1 yr/5 yrs	Immediately	
	DI-2	Specify Action - Location of Airports	Municipality		N/A	Immediately	
ALL LAKE ONTARIO THREATS							
4 Policies	LO-G-1	Specify Action - Spill Prevention, Contingency Plans, Emergency Plans	MOECC		2 yrs		
	LO-G-2	Specify Action - Lake Ontario Collaborative Group	MOECC		2 yrs		
	LO-G-3	Specify Action - Lake Ontario Collaborative Group	Municipality (Peel, Durham, TO)		2 yrs		
	LO-G-4	Education and Outreach - Collaboration with other stakeholders	MOECC		2 yrs		
LAKE ONTARIO - SPILL OF TRITIUM FROM NUCLEAR GENERATING STATION							
1 Policy	LO-NGS-1	Specify Action - Risk Management Plan / Risk Reduction Plan	MOECC		2 yrs		
LAKE ONTARIO - ESTABLISHMENT, OPERATION, OR MAINTENANCE OF A SYSTEM THAT COLLECTS, STORES, TRANSMITS, TREATS, OR DISPOSES OF SEWAGE							
2 Policies	LO-SEW-1	PI - Spill Prevention and Contingency Plans	MOECC		3 yrs	Immediately	
LAKE ONTARIO - SPILL FROM A SANITARY TRUNK SEWER BREAK							
2 Policies	LO-SEW-2	PI - Spill Prevention and Contingency Plans	MOECC		3 yrs	Immediately	
LAKE ONTARIO - ALL THREATS THAT ARE LINKED TO STORM SEWERS							
1 Policy	LO-SEW-3	Specify Action - Enact necessary regulation / instrument - Spill Prevention Plans	MOECC		2 yrs		
LAKE ONTARIO - PIPELINES TRANSPORTING PETROLEUM PRODUCT (CONTAINING BENZENE) CROSSING TRIBUTARIES OF LAKE ONTARIO							
1 Policy	LO-PIPE-1	Specify Action - Spill Prevention, Contingency Plans, Emergency Plans	MOECC		2 yrs		
LAKE ONTARIO - HANDLING AND STORAGE OF FUEL (PETROLEUM TANK FARM SPILL)							
2 Policies	LO-FUEL-1	Specify Action - Spill Prevention and Contingency Plans	MOECC		2 yrs		
	LO-FUEL-2	Education and Outreach - Investigate spill and contingency plans, BMPs	MOECC		2 yrs		
AN ACTIVITY THAT TAKES WATER FROM AN AQUIFER WITHOUT RETURNING THE WATER TAKEN TO THE SAME AQUIFER							
11 Policies	DEM-1	PI - Permits to Take Water - WHPA-Q1	MOECC	MOECC	3 yrs	Immediately	
	DEM-2	LUP - Linked to Permits to Take Water - WHPA-Q1	Planning Approval Authority		N/A	Immediately	
	DEM-3	Specify Action - Growth Management	MMA		2 yrs		
	DEM-4	Specify Action - Municipal Water Conservation Plans	Municipality		2 yrs		
	DEM-5	Education and Outreach - Water Conservation Efforts	Municipality		2 yrs		

11 Policies	DEM-6	Specify Action - Joint Municipal Water Management Model	Municipality	MMAH	1 yr/3 yrs		
	DEM-7	Specify Action - Province to Support Join Municipal Water Management Model	MOECC		1 yr/3 yrs		
	DEM-8	Specify Action - Fund Maintenance of the Tier 3 Water Budget Model	MOECC		2 yrs		
	DEM-9	Specify Action - Identifying Additional Water Supplies	Municipality		3 yrs		
	DEM-10	Specify Action - Drought Management Plan	York Region		Immediately		
AN ACTIVITY THAT REDUCES RECHARGE TO AN AQUIFER							
3 Policies	REC-1	LUP - Best Management Practices, Water Balance Assessments	Planning Approval Authority		N/A	Immediately	
	REC-2	Part IV - Management - WHPA-Q2 - Building Permit	RMO		N/A	Immediately	
	REC-3	Specify Action - Education & Outreach, By-Law, LID	Municipality		2 yrs		