DRINKING WATER SOURCE PROTECTION
Our Actions Matter
CTC Source Protection Region

# CTC Source Protection Plan

## NOTICE OF AMENDMENTS

Currently proposed amendments to this document, made under Ontario Regulation 287/07, Section 34, following its approval in July 2015 and previously approved amendments, are summarized in the table below. Page references are to those of the pdf. The proposed amendments to the document are highlighted in yellow.

**DATE PROPOSED AMENDMENTS POSTED: Monday June 5, 2023**

Table: Summary of Anticipated Section 34 Amendments to the CTC Source Protection Plan

| No. | Section or Figure | Brief Description of Anticipated Amendment | Estimated Timing to Submit Proposed Amendment to Ministry of the Environment, Conservation, and Parks |
|---|---|---|---|
| **1.** | Cover page (p.3-4), footers (all pages) | Update to version number; date of approval and effective dates | September 2023 |
| **2.** | Preface (p.5) | Update text to reflect Technical Rules version used for technical work | September 2023 |
| **3.** | Version control table (p.6) | Add new version and amendment description | September 2023 |
| **4.** | Section 2.1, Figure 2-2 (p.8-9) | Update to include new/revised WHPAs and IPZs | September 2023 |
| **5.** | Section 2.1 (p.9) | Number of supply wells update | September 2023 |
| **6.** | Section 3.3, Table 3-1b (p. 11) | Update SPC membership | September 2023 |
| **7.** | Section 4.1.2 (p.13) | Update text to reflect amendment | September 2023 |
| **8.** | Section 5.1.10 (p.14-15) | New section on consultation related to this amendment | September 2023 |
| **9.** | Section 6.1.1, Table 6-1 (p.17) | Updates to well counts | September 2023 |
| **10.** | Section 6.1.4 (p.19) | Updated SGRA description | September 2023 |
| **11.** | Section 7.2 (p.21-22) | Updates transport pathways section text | September 2023 |
| **12.** | Section 8.3 (p.25-26) | Update text on amendment process | September 2023 |
| **13.** | Section 9.2 (p.28) | Clarification of use of 2021 DTR's | September 2023 |
| **14.** | Section 10.1.2 (p.29-31) | Revisions to Existing Threat Activity, Transition and Amendments definitions text | September 2023 |

| | | | |
|---|---|---|---|
| **15.** | Section 10.1.3 (p.32) | Revision to Timelines for Implementation text | September 2023 |
| **16.** | Table 10-1 (p.33-34) | Policy T-6 deadlines clarification | September 2023 |
| **17.** | Chapter 10 (p.35-65) | Updates to Tables 10-2 to 10-14 to show where significant threats can exist under different Director's Technical Rules versions | September 2023 |
| **18.** | Section 10.10, Tables 10-12 & 10-13 (p.55-64) | Revision of background text to DNAPL and organic solvent threats; revised DNAP-1 and OS-1 policies | September 2023 |
| **19.** | Section 10.12.3 (p.66) | Updated modelled spill scenario description | September 2023 |
| **20.** | Section 12 (p. 68) | Update to include Director's Technical Rule (DTR) definition | September 2023 |
| **21.** | Map 1.8 (p.74) | Updated Caledon Village significant groundwater quality threat areas (WHPAs, vulnerability scores) | September 2023 |
| **22.** | Map 2.8 (p.76) | Updated Caledon Village significant DNAPL threat areas (WHPAs) | September 2023 |
| **23.** | Map 1.11 (p.78) | Updated Caledon East significant groundwater quality threat areas (WHPAs, vulnerability scores) | September 2023 |
| **24.** | Map 2.11 (p.80) | Updated Caledon East significant DNAPL threat areas (WHPAs) | September 2023 |
| **25.** | Map 1.12 (p.82) | Updated Palgrave significant groundwater quality threat areas (WHPAs, vulnerability scores) | September 2023 |
| **26.** | Map 2.12 (p.84) | Updated Palgrave significant DNAPL threat areas (WHPAs) | September 2023 |
| **27.** | Map 1.17 (p.86) | Updated Nobleton significant groundwater quality threat areas (WHPAs, vulnerability scores) | September 2023 |
| **28.** | Map 2.17 (p.88) | Updated Nobleton significant DNAPL threat areas (WHPAs) | September 2023 |
| **29.** | Map 3.5 (p.90) | Updated WHPAs in WHPA-Q Downgradient Line map | September 2023 |
| **30.** | Map 4.1 (p. 92) | Updated map to include the updated Toronto Island intake locations and WWTP Diffusers | September 2023 |
| **31.** | Map 4.2 (p.94) | Updated map to include the updated Toronto Island intake locations | September 2023 |


DRINKING WATER SOURCE PROTECTION
Our Actions Matter
CTC Source Protection Region

# ~~Approved~~ Proposed Amended Source Protection Plan:

# CTC Source Protection Region

Prepared by: CTC Source Protection Committee

Amendment (Version ~~5~~6.0 – Proposed June 5, 2023)
Approved: ~~February 23, 2022~~TBD
Effective Date: ~~March 2, 2022~~TBD

DRINKING WATER SOURCE PROTECTION
Our Actions Matter

CTC Source Protection Region

## ~~Approved~~ Proposed Amended Source Protection Plan:

# CTC Source Protection Region


Credit Valley Conservation
inspired by nature

Central Lake Ontario Conservation Authority

Toronto and Region Conservation Authority

Ontario

This project has received funding support from the Government of Ontario

**PREFACE**

This document was prepared by staff at the CTC (Credit Valley-Toronto and Region-Central Lake Ontario) Source Protection Region. The policies have been developed by the Source Protection Committee (SPC). This Source Protection Plan was submitted jointly by the respective Source Protect\ion Authorities (SPAs) to the Minister of the Environment and Climate Change and has received approval.

The objective of this document is to provide the approved policies that the CTC SPC has developed, which when implemented, are to protect existing and future municipal drinking water sources.

The policies contained within this document are approved. If you have any questions about this document or the CTC Source Protection Region, please contact staff at:

(905) 670-1615 Ext. 379, ctcswp@cvc.ca or visit www.ctcswp.ca.

Note to readers: In June 2014 the Ministry of the Environment (MOE) was renamed the Ministry of the Environment and Climate Change (MOECC). In June 2018, the Ministry was renamed to the Ministry of the Environment, Conservation and Parks (MECP). Where the document references MOE or MOECC, it indicates activities/ milestones which occurred before the respective name changes.

Amendments to the Source Protection Plan resulting in versions 2, 3 and 4 were made using the 2017 Director's Technical Rules and Tables of Drinking Water Threats. Amendments to the Source Protection Plan resulting in version 6~~2, 3 and 4~~ were made using the 2017 and/or 2021 Director's Technical Rules and Tables of Drinking Water Threats as described in the Version Control table below. Sections of the Source Protection Plan that were not updated as part of those amendments refer to the 2009 edition of the Director's Technical Rules and Tables of Drinking Water Threats.

**Version Control**

| Version | Approval Date | Effective Date | Description of Amendment |
|---|---|---|---|
| 1.0 | July 22, 2015 | December 31, 2015 | N/A |
| 2.0 | March 11, 2019 | March 25, 2019 | Incorporation of new policy applicability maps for Inglewood and Caledon East Drinking Water Systems; revisions to policies SAL 10-13; REC-1; SNO-1; SWG-3; and the transition provision. Amended text to reflect consultation completed. |
| 3.0 | December 3, 2019 | December 5, 2019 | Incorporation of new policy applicability maps for the Alton Wellfield, part of the Caledon Village – Alton Drinking Water System. Amended text to reflect consultation completed. |
| 4.0 | February 23, 2022 | March 2, 2022 | Incorporation of updated text and policy maps relating to updates to the Aurora Drinking Water System. Amended text to reflect consultation completed. Minor typographical changes to Chapters 1, 3, 7-8, 10-11 and Appendix F. |
| 5.0 | n/a | n/a | Amendment under s. 51 of O. Reg. 287/07 in April 2022. Minor typographical and mapping changes, and error corrections, in |

| | | | |
|---|---|---|---|
| | | | Chapters 2-4, 6-10, and Appendix F. Removal of references to decommissioned Inglewood Well 2.<br>Date amendment posted: May 20, 2022 |
| 6.0 | TBD | TBD | Incorporation of updated text and policy maps relating to updates to the Palgrave-Caledon East and Caledon Village – Alton Drinking Water Systems (2021 Director's Technical Rules); the City of Toronto (Island) Drinking Water System (2017 Director's Technical Rules) and the Nobleton Drinking Water System (updates to managed lands, livestock density and impervious surface used 2021 Director's Technical Rules). Revisions to existing threat definition, and transition, timeline, DNAP-1 and OS-1 policies. Amended text to reflect consultation completed. |

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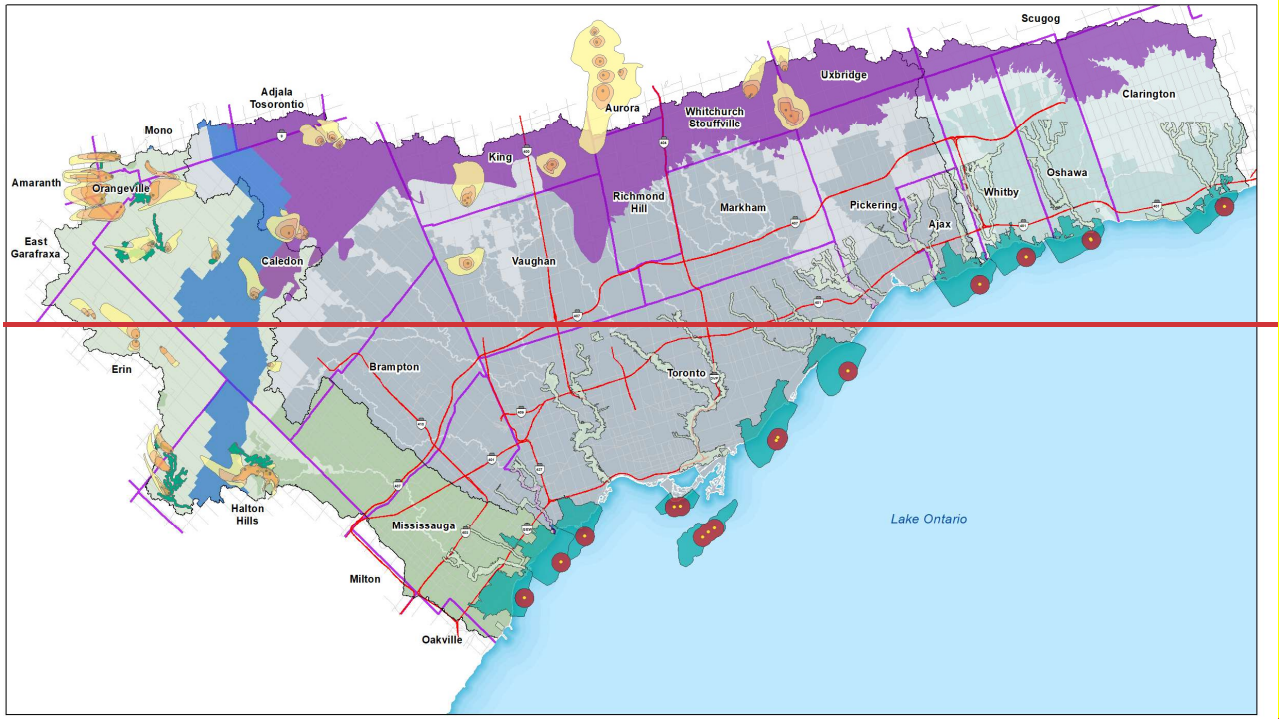
## 2.1 CTC SOURCE PROTECTION REGION

The CTC Source Protection Region (**Figure 2-2**) contains 25 large and small watersheds and spans over 10,000 km$^2$, from the Oak Ridges Moraine in the north to Lake Ontario in the south. The region contains portions of the Niagara Escarpment, Oak Ridges Moraine, Greenbelt, Lake Ontario and the most densely populated region of Canada.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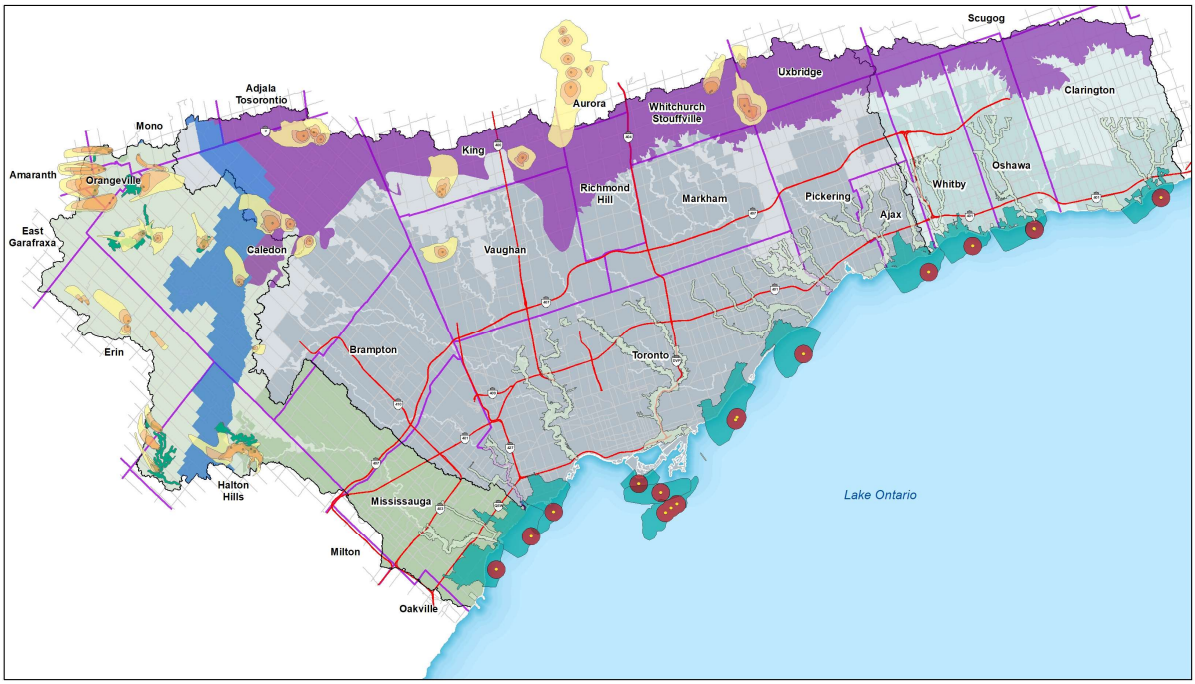


**Figure 2-2: Map of the CTC Source Protection Region**

The CTC Source Protection Region includes:

- 25 local municipalities and eight single tier, regional or county municipalities;
- 6~~3~~6 active municipal supply wells; and
- 16 municipal surface water intakes on Lake Ontario.

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. This diverse setting represents a significant challenge for the development of the SPP because of the variability of available information upon which to base the technical work, the differing stresses on water resources related to development pressure and population growth, and the differences in the nature, density, and locations of threats to the quality and quantity of water resources.

## 3.2 SOURCE PROTECTION AUTHORITY (SPA)

The Source Protection Authority is a new body created under the *Clean Water Act, 2006*. The SPAs are made-up of the members of the boards of existing conservation authorities. Initially, it had the important role of laying the groundwork for the new source protection process in each source protection area. This included creating the SPCs and engaging municipalities in that process.

In the CTC SPR, there are three Source Protection Authorities:

- Credit Valley (lead SPA: 2021-present)
- Toronto and Region (lead SPA: 2007-2021)
- Central Lake Ontario

The SPAs role has changed over time. Once the SPC was created, the SPAs role focused on supporting the SPC in its duties. The SPA will continue to have a role in monitoring and reporting on progress in implementing the Approved Source Protection Plan.

## 3.3 SOURCE PROTECTION COMMITTEE (SPC)

In addition to the SPA, the *Clean Water Act, 2006* created a second watershed-level body, the Source Protection Committee. The SPC is the primary driver of the process at the watershed level. The *Clean Water Act, 2006* and associated regulation establishes one SPC for each SPR and sets the size of the SPC. The lead SPA appoints the members of the SPC. The chair of the SPC, however, is appointed by the Minister of Environment. The SPC is made up of a mix of local citizens, who live or work in the watershed, and who applied for that role and were selected by the SPA based on a competitive process. Each municipal member of the SPC was selected by the group municipal councils represented by the member and endorsed by council resolutions. The number of committee members varies by region. In the CTC SPR, there are 21 committee members, plus the chair **(Table 3-1a, Table 3-1b)**. Of the 21 members, one third represent the economic sector, one third represent the municipal sector, and one third represent the general public (includes environmental group representation). The SPC is responsible for preparing the Terms of Reference, the Assessment Reports, and the Source Protection Plan. The SPC is also responsible for ensuring that stakeholders and the public are consulted throughout the process.

**Table 3-1a: CTC SPC Membership (at CTC SPP Submission, December 2014)**

| Chair: Susan Self | | |
|---|---|---|
| **Economic** | **Municipal** | **Public** |
| **Andrea Bourrie**<br>Aggregate | **Bob Burnside**<br>Dufferin County | **Julie Abouchar**<br>Public at large |
| **Doug Brown**<br>Energy | **Michael D'Andrea**<br>City of Toronto | **Michael Garrett**<br>Public at large |
| **Wendy Burgess**<br>Golf Course | **David Kentner**<br>Region of Halton and County of Wellington | **Jessica Ginsburg**<br>Environmental |
| **Louise Foster**<br>Development | **Laura McDowell/Don Goodyear**<br>Region of York | **Bob Goodings**<br>Public at large |
| **Heather Laidlaw**<br>Agriculture | **John Presta**<br>Region of Durham | **Irv Harrell**<br>Public at large |
| **Peter Miasek**<br>Petroleum Products | **Mark Schiller**<br>Region of Peel | **Peter Orphanos** (deceased)<br>Environmental |
| **Lynne Moore**<br>Agriculture | **Howard Shapiro**<br>City of Toronto | **Fred Ruf**<br>Public at large |

**Table 3-1b: Current CTC SPC Membership (June~~March 2022~~2023)**

| Chair: ~~Doug Wright~~~~Vacant~~Nathan Hyde | | |
|---|---|---|
| **Economic** | **Municipal** | **Public** |
| ~~Vacant~~Colin Evans<br>Aggregate | **Chris Gerrits**<br>Dufferin County | **Julie Abouchar**<br>Public-at-large |
| **Lee Gould**<br>Road Salt | **Frank Quarisa**<br>City of Toronto | **Ken Dion**<br>Public-at-large |
| ~~Vacant~~~~Dan Bunner~~<br>Chemicals | **Liza Ballantyne**<br>City of Toronto | ~~Vacant~~Mark Heaton<br>Environmental |
| **Louise Foster**<br>Development | **Scott Lister**<br>Region of York | ~~Behnam~~ ~~Doulatyari~~Cody Brown<br>Public-at-large |
| **Gary Mountain**<br>Agriculture | **John Presta**<br>Region of Durham | **Peter Miasek**<br>Public-at-large |
| ~~Vacant~~Ryan Wheeler<br>Petrochemical | **Elvis Oliveira**<br>Region of Peel | **Rosemary Keenan**<br>Environmental |
| **Geoff Maltby**<br>Agriculture | Vacant ~~David Kentner~~<br>Region of Halton and County of Wellington | **Jeff Light**<br>Public-at-large |

### 4.1.2 The Assessment Reports

There are three Assessment Reports **(see Appendix A)** – one for each SPA within the CTC SPR:

- Credit Valley Source Protection Area
- Toronto and Region Source Protection Area
- Central Lake Ontario Source Protection Area

The Assessment Reports are technical documents that provide the scientific understanding that is the basis of the SPP. The Assessment Reports describe:

- the local watershed and assess available water supply
- the vulnerable areas and risks to drinking water
- the maps of the vulnerable areas
- the vulnerability of those areas
- the water quality and quantity issues related to water sources
- an assessment of the risk to water systems

The Assessment Reports are 'living documents' that will be continually updated and amended as new information becomes available. The Assessment Reports also identify the work that must be undertaken before the SPP is completed. The Assessment Reports are based on the completion of detailed technical studies. These reports underwent a peer review process that enabled scientists and other experts to evaluate the technical work for technical completeness and whether it met the provincial rules and guidelines.

The CTC proposed Assessment Reports were submitted to the Ministry of the Environment for approval in December 2010. At that time, additional research was being carried out. The new information was then used to update the reports which were submitted to the Ministry of the Environment in July 2011 and were approved in January 2012 **(Appendix A)**. Further updates to portions of the Assessment Reports were submitted in late 2014 and early 2015 and were approved in July 2015. This update includes revised Wellhead Protection Areas (WHPAs) and updates to the threats assessment and identification around wells owned and operated by the Region of Halton near Georgetown and Acton (Town of Halton Hills). Other updates to the Assessment Reports include the results of the Tier 3 Water

Budget studies for both Region of Halton wells serving Halton Hills; and all of the Region of York wells and Region of Durham wells in Uxville.

Since the CTC Source Protection Plan came into effect on December 31, 2015, the assessment reports have been periodically amended and updated as follows:

- In June 2018, minor amendments were made to the Credit Valley, Toronto and Region, and Central Lake Ontario Assessment Reports, as permitted under O. Reg. 287/07 s.51.
- In March 2019, the Credit Valley and Toronto and Region Assessment Reports were amended for to include revisions to the vulnerable areas around wells owned and operated by the Region of Peel near Caledon East and Inglewood.
- In December 2019, the Credit Valley Assessment Report was updated in response to changes to the Alton wellfield.
- In March 2022, the Toronto Region Assessment Report was amended in response to changes to the Aurora wellfield and some minor updates under s.51 of O. Reg 287/07 resulting from 2017 changes to the technical rules. The associated vulnerable area is delineated in the Toronto and Region Assessment Report. While a system map for the Aurora wellfield showing where policies apply **(Appendix F)** remains excluded from the Source Protection Plan as there is no applicable policy area. An updated Downgradient Line policy map was included within this update.
- In May 2022, the Credit Valley, Toronto and Region, and Central Lake Ontario Assessment Reports were amended under s. 51 of O. Reg. 287/07 in response to decommissioning of a well in the Inglewood wellfield and updates resulting from 2017 changes to the technical rules.
- In 2023, amendments were proposed to the Credit Valley, and Toronto and Region, Assessment Reports under s. 34 of the *Clean Water Act, 2006*. Changes included updates to drinking water systems (DWS) in the Regional Municipality of Peel (Palgrave-Caledon East DWS and Caledon Village – Alton DWS), Regional Municipality of York (Nobleton DWS), and City of Toronto (Island DWS).

confirmed no concerns with the amendment to the CTC Source Protection Plan, including the Credit Valley Assessment Report.

Landowners identified through aerial photography as potentially engaging in activities which could be considered significant drinking water threats received written correspondence to invite comments on the amendments. Peel Region staff conducted field visits and followed up with the landowners (~40) who had received formal correspondence to confirm the nature of activities, if any, taking place within the new wellhead protection areas. Given the timing of the public consultation period and the need for an accelerated timeline to incorporate the new technical work into the CTC Source Protection Plan, Peel Region opted to forgo a public consultation meeting.

### 5.1.9 Formal Consultation on Amendments to Approved Source Protection Plan (January – February 2020, Version 4.0)

In 2016, the Region of York drilled a new drinking water well (Well PW7) in the Aurora Wellfield. The WHPA-D for the new well extends into TRSPA. A pre-consultation period for the new WHPA took place in October – November 2019 in partnership with the South Georgian Bay – Lake Simcoe Source Protection Region. Between January 16th and February 20th, 2020, the Toronto and Region Source Protection Authority, the CTC Source Protection Committee, and the South Georgian Bay – Lake Simcoe Source Protection Region consulted on these amendments with the public. No comments were received from the public. However, following a teleconference on March 30, 2020, the Ministry of Environment, Conservation and Parks noted concerns with the approach and methodology used to update the Newmarket-Aurora wellhead protection area in a memo dated April 15, 2020. The revised modelling undertaken by the Region of York resulted in minor changes to the extents of the WHPA-A, B, C & D, including within the Toronto and Region Source Protection Area. The revision included a small (< 1ha) expansion of the WHPA-D to the south. There were no changes to the enumeration of significant drinking water threats in the TRSPA jurisdiction.

### 5.1.10 Formal Consultation on Amendments to Approved Source Protection Plan (June – July 2023, Version 6.0)

Peel Region has proposed updates to WHPA's in their Palgrave-Caledon East (allocation increase at Palgrave Well 4, new Caledon East Well 6) and Caledon Village – Alton (identification of WHPA for

existing Well 3B) Drinking Water Systems. The City of Toronto has proposed updates relating to a new Toronto Island Water Treatment Plant intake (Intake 4) and identification of event-based significant threats from an under-construction Ashbridges Bay Treatment Plant outfall. The Region of York has added a new well, PW7, in close proximity to existing well PW3, with only minor mapping changes required. Revisions have also been proposed to the existing threat definition, and transition, timeline, DNAP-1 and OS-1 policies.

A pre-consultation period for the proposed amendments occurred from ~~is planned for~~ March – May 2023 in partnership with the South Georgian Bay – Lake Simcoe Source Protection Region. Consultation with the public, by the Toronto and Region Source Protection Authority, the Credit Valley Source Protection Authority, the CTC Source Protection Committee, and the South Georgian Bay – Lake Simcoe Source Protection Region is ~~anticipated~~scheduled between June 5th and July 12th, 2023.

# 6 DRINKING WATER VULNERABILITY ANALYSIS AND THREATS EVALUATION

## 6.1 TYPES OF VULNERABLE AREAS

This chapter provides an overview of the methodology and definitions developed by the Ministry of the Environment to identify drinking water threats. The ministry developed mandatory *Technical Rules* that must be followed by all Source Protection Committees, as well as extensive guidance and full funding to carry out this technical assessment. These processes are important components in the multi-barrier approach to protecting drinking water sources from contamination and overuse. Source protection technical work is focused on the identification and assessment of drinking water quality and quantity threats and issues affecting four different types of vulnerable areas.

### 6.1.1 Wellhead Protection Areas (WHPA)

Wellhead Protection Areas are areas on the land around a municipal well, the size of which is determined by how quickly water travels underground to the well, measured in years. For source protection planning, the *Clean Water Act, 2006* required that a standard 100-metre radius circle be provided around each municipal well; this is called WHPA-A. WHPA-B represents the 2-year time of travel; WHPA-C represents the 5-year time of travel; and WHPA-D represents the 25-year time of travel. WHPA-E represents municipal wells that are under the direct influence of surface water. The size and shape of each WHPA (B, C, D or E) is a function of how water travels underground. Time of travel is important because it is an indication of how quickly a contaminant can move from a WHPA into a municipal well. Time of travel can be influenced by a number of factors such as the slope of land, and the type of soil (for example, water travels faster through sand than it does through clay). Wellhead Protection Areas are drawn based on scientific research that took all these factors into consideration. **Table 6-1** provides a list of the number of WHPAs throughout the CTC Source Protection Region. This research was undertaken in the development of the Assessment Reports and details about each specific well can be found in those documents. The maps in **Appendix F** of this document show where significant drinking water threat polices will apply in the specific WHPAs in the CTC Source Protection Region.

**Table 6-1: Well Count by Municipality**

| Source Protection Area | Upper Tier Municipality | Lower Tier Municipality (Water System) | Well Count |
|---|---|---|---|
| Credit Valley | Dufferin County | Mono (Island Lake) | 2 |
| | | Mono (Coles) | 2 (alternates) |
| | | Mono (Cardinal Woods) | 3 |
| | | Amaranth (Amaranth-Pullen) (off-line) | 1 |
| | | Orangeville (Orangeville) | 12 |
| | Wellington County | Erin (Bel-Erin) (off-line) | 2 |
| | | Erin (Erin) | 2 |
| | | Erin (Hillsburgh) | 2 |
| | Halton Region | Halton Hills (Acton) | 5 |
| | | Halton Hills (Georgetown) | 7 |
| | Peel Region | Caledon (Alton, Caledon Village) | ~~4~~5 |
| | | Caledon (Cheltenham) | 2 |
| | | Caledon (Inglewood) | 2 |
| Toronto and Region | Peel Region | Caledon (Caledon East) | ~~3~~4 |
| | | Caledon (Palgrave) | 3 |
| | York Region | Whitchurch-Stouffville | 5 |
| | | King (King City) | 2 |
| | | King (Nobleton) | ~~3~~4 |
| | | Vaughan (Kleinburg) | 2 |
| | Durham Region | Uxbridge (Uxville Well) | 2 |
| Central Lake Ontario | No municipal wells | | |
| **TOTAL** | | | ~~66~~69 |

Note: The Cardinal Woods 3 (Town of Mono) and Palgrave 3 (Peel Region) wells are located just outside CTC in the SGBLS Source Protection Region but are included in the above table.

### 6.1.2 Intake Protection Zones (IPZ)

Intake Protection Zones are the area on the water and land surrounding a municipal surface water intake. The size of each zone is determined by how quickly water flows to the intake, in hours. Because surface water travels much faster than groundwater, the IPZ is drawn primarily for emergency response purposes. There are three categories of IPZs; the IPZ-1 is a one-kilometre circle around the intake if it is located in one of the Great Lakes; the IPZ-2 is the area where water can reach the intake in a specified time, two hours was used in the CTC. According to the MOE *Technical Rules*, there can be no significant threats in an IPZ-1 or IPZ-2 if it is located in one of the Great Lakes (e.g., Lake Ontario). An IPZ-3 is delineated if modelling demonstrates that spills from a specific activity that is located outside IPZ-1 and IPZ-2 may be transported to an intake and result in a deterioration of the water quality at an intake. Since the vulnerability scores of IPZ-1 and IPZ-2 are not high enough to identify significant threats, the modelling approach can also be used for activities within IPZ-1 and IPZ-2 to determine if spills from a specific activity within these zones may reach the intake and result in deterioration of the water quality at an intake. If modelling in IPZ-1, -2, or -3 demonstrates this deterioration, the modelled threats are deemed significant drinking water threats under the provincial rules. The modelling results are also used to delineate event based areas within IPZs where modelled activities are deemed significant. **Table 6-2** provides a list of the surface water intakes (all are located in Lake Ontario) in the CTC Source Protection Region.

**Table 6-2: Intake Protection Zones-3 by Municipality**

| Source Protection Area | Upper Tier Municipality | Water System | Number of Intakes |
|---|---|---|---|
| Credit Valley | Peel Region | Lorne Park | 1 |
| | | A.P. Kennedy (formerly 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** |

### 6.1.3 Highly Vulnerable Aquifers (HVA)

An aquifer is an area underground that is highly saturated with water – enough water that it can be withdrawn for human use. A Highly Vulnerable Aquifer is one that is particularly susceptible to contamination because of its location near the ground's surface or where the types of materials in the ground around it are highly permeable. For example, clay is more impermeable and typically acts to protect the aquifer below it, compared to sand and fractured bedrock which are both highly permeable and do not have these protective characteristics.

### 6.1.4 Significant Groundwater Recharge Areas (SGRA)

Significant Groundwater Recharge Areas are areas on the landscape that are characterized by porous soils, such as sand or gravel, which allows water to seep easily into the ground and flow to an aquifer. A recharge area is considered significant when it replenishes an underlying aquifer at a rate greater than the recharge rate for a larger groundwater recharge area. These recharge areas can ~~rate of recharge for~~ helps ~~s~~ maintain the water level in ~~an~~ aquifers that supp~~liesy a~~ communit~~y~~ies or private residences with drinking water. Numerical thresholds are used to calculate where these significant recharge areas are located.

### 6.1.5 Wellhead Protection Area-Q (Water Quantity)

Water quantity vulnerable areas are determined differently than other vulnerable areas. Through a tiered process of water budget analyses as set out in the *Technical Rules* under O. Reg. 287/07, SPCs are required to identify any areas with water quantity stress, determine the stress level in the Wellhead Protection Area-Q (WHPA-Q), and where the level is deemed significant or moderate, also identify the type and location of the activities that pose a drinking water quantity threat. At the final stage (Tier 3 Water Budget analysis), any WHPA-Q areas where significant or moderate drinking water stress has been identified is an area where significant drinking water quantity threat activities can occur. Within

these areas, future activities which take water without returning it to the same source or which reduce recharge to the aquifer are significant water quantity threats. If the area has a significant risk level assigned then existing activities are also significant water quantity threats. There are two types of WHPA-Q; WHPA-Q1, and WHPA-Q2. WHPA-Q1 refers to the area where activities that take water without returning it to the same source may be a threat. WHPA-Q2 refers to the area where activities that reduce recharge may be a threat. Source Protection Plan policies must be developed to address significant water quantity threats. See **Chapter 10.13** for more details on the water quantity policies.

### 7.1.4 Enumerating Drinking Water Threats

The minimum requirement for the preparation of the Assessment Reports involved counting the potential significant drinking water threats within WHPAs or IPZs where the risk could be 'significant' based on the vulnerability score of the area. Policies must be developed to mitigate existing significant drinking water threats and ensure activities do not become a significant drinking water threat. The threats identified in the Assessment Reports are *potential* threats only. If an identified property does not have a specific threat activity being carried out on it then the 'existing' threat policies in the SPP for that threat would not apply. Conversely, even though a threat activity is not identified on a property, the relevant SPP policies apply if the threat activity is being carried out now or in the future.

## 7.2 TRANSPORT PATHWAYS

The vulnerability of an aquifer may be increased by any land use activity or feature that disturbs the surface above the aquifer, or which artificially enhances flow to that aquifer. Man-made transport pathways include pits, quarries, mines, road cuts, ditches, storm water, pipelines, sewers, and poorly constructed wells. These pathways can bypass the natural system, resulting in faster pathways for contamination to reach the well or intake. For groundwater drinking water wells, if any of these constructed pathways exist in a water source, the vulnerability score increases by one or two steps (i.e., from low to medium, from medium to high, or from low to high). The decision by the SPC to increase the vulnerability score for an area should be supported by data and use professional judgment. When determining whether the vulnerability of an area has increased, the following factors shall be considered, as per *Technical Rule 41*.

Hydrogeological conditions:

- The type and design of any transport pathways;
- The cumulative impact of any transport pathways; and
- The extent of any assumptions used in the assessment of the vulnerability of the groundwater.

Examples of features that may provide a transport pathway that could result in an increase in vulnerability of a water supply source include:

~~A "condition" is defined as a past land use activity which may pose a problem to water quality.~~

~~An "issue" is defined as a documented water quality problem.~~

- Existing wells or boreholes
- Unused or abandoned wells
- Pits and quarries
- Mines

The *Technical Rules* indicate that a Source Protection Committee may conclude that the data available may be insufficient or of too poor quality to justify an increase in vulnerability.

~~Several datasets for pathway features were reviewed in an attempt to assess transport pathways within the CTC Source Protection Region. Only the data for pits and quarries were deemed sufficient to adjust the vulnerability score within WHPAs and HVAs.~~

As part of the initial round of technical work prior to approval of the first source protection plan, several datasets for pathway features were reviewed in an attempt to assess transport pathways within the CTC Source Protection Region. At that time, only the data for pits and quarries were deemed sufficient to adjust the vulnerability score within WHPAs and HVAs. In 2022, the Credit Valley Source Protection Authority re-evaluated transport pathways across their jurisdiction, as part of their section 36 workplan. On Dec. 7, 2022, the CTC Source Protection Committee directed that the transport pathways technical report be provided to municipalities as guidance for assessing transport pathways; and the guidance was later incorporated in a Transport Pathway Guidance Document released by Conservation Ontario on January 20, 2023. The Region of Peel implemented the methodology outlined in the 2022 technical report as part of their updates to the Caledon Village – Alton and Palgrave — Caledon East Drinking Water System Drinking Water Systems and included as part of proposed 2023 amendments to the Source Protection Plan (Proposed Version 6.0), ~~and~~ Credit Valley Assessment Report (Proposed Version 5.0), and Toronto and Region Assessment Report (Proposed Version 6.0).

begun to, or had addressed many comments the Director outlined in her letter. On June 24, 2014, the CTC Source Protection Committee met and endorsed the Amended Proposed Source Protection Plan policies for a 35-day public consultation period and also posted the Director's letter as part of the consultation material.

Chapter 5.1 of this document describes the process followed by the SPC to assess and revise the policies during the pre-consultation and formal consultation on the Amended Source Protection Plan policies. Following the consultation period, comments were considered and taken to the SPC in September 2014. SPC directed staff to make changes, resolve any outstanding Lake Ontario policy concerns (as detailed, above), and bring the Amended Source Protection Plan to the SPC for final endorsement and approval in November 2014.

Following the Source Protection Committee endorsement of the Amended Proposed Source Protection Plan on November 13, 2014, the Chairs of the Source Protection Authority jointly submitted the Amended Proposed Source Protection Plan and Explanatory Document to the Minister of the Environment and Climate Change on December 15, 2014.

## 8.3 AMENDMENTS TO APPROVED SOURCE PROTECTION PLAN

At CTC Source Protection Committee Meeting #1/16, held on November 28, 2016, members heard from municipal stakeholders presented challenges with the implementation of certain CTC Source Protection Plan policies. At this same meeting, through Resolution #5/16, the Committee established a Working Group to deliberate amendments to the CTC Source Protection Plan. A number of CTC Source Protection Committee members sit on this Working Group, as well as representatives from each of the municipalities in the CTC Source Protection Region with municipal drinking water systems. The amendments prepared during this period of time address implementation challenges to a number of policies in the CTC Source Protection Plan as well as ensures consistency between Foundation Reports and the Assessment Reports. In addition, technical information has been incorporated into the Credit Valley and Toronto and Region Assessment Reports associated with changes to municipal wellfields.

Municipal stakeholders were asked to document implementation challenges in their Annual Reporting submissions due to Toronto and Region, Credit Valley, and Central Lake Ontario Source Protection Authorities by February 1, 2017. This reporting corresponded with the completion of the first year of implementing the CTC Source Protection Plan. In May 2017, CTC Source Protection Region staff met with each municipality to discuss this feedback. On June 15, 2017, the Amendments Working Group convened its first meeting. Additional meetings were held in September 2017, October 2017, January 2018, and February 2018 to discuss and prepare policy revisions.

At CTC Source Protection Committee Meeting #1/18, held on March 21, 2018, through Resolution #6/18, members endorsed the amended policy text and directed the staff to proceed with pre-consultation with implementing bodies.

Between May and October 2018, municipal staff advised their respective Councils of amendments to the CTC Source Protection Plan through reports. Requisite Council Resolutions were obtained from municipalities affected by policy and technical amendments to the CTC Source Protection Plan; specifically, those municipalities impacted by significant drinking water threat policies. Prior to public consultation, Council Resolutions endorsing the proposed amendments were acquired from the following municipalities:

- Dufferin County
  - Town of Mono
  - Township of Amaranth
  - Township of East Garafraxa
  - Town of Orangeville
- Wellington County
  - Town of Erin
- Peel Region
  - Town of Caledon
- Halton Region
  - Town of Halton Hills
- York Region
  - Town of Whitchurch-Stouffville
  - City of Markham
  - Town of Richmond Hill
  - City of Vaughan
  - Town of Aurora
  - Township of King
- Durham Region
  - City of Pickering
  - Township of Uxbridge

At CTC Source Protection Committee Meeting #3/18, held on September 19, 2018, members discussed the feedback received through pre-consultation discussions with municipalities. Very minor changes were needed to the policy text circulated for pre-consultation to municipal partners. Revised policy text and proposed technical amendments to the Inglewood and Palgrave-Caledon East Municipal Drinking Water Systems was endorsed by the Committee at this September 2018 meeting for public consultation.

Public consultation was held between Thursday, October 11, 2018 and Thursday, November 18, 2018. Notice of the proposed amendments was posted on the CTC Source Protection Region website (www.ctcswp.ca) and social media used to advise the public of opportunities to comment. Implementing bodies were notified of proposed amendments formally in writing.

The Amendments Working Group convened on Tuesday, November 20, 2018 to discuss feedback obtained through public consultation and advised whether changes needed to be made to either the Credit Valley Assessment Report, the Toronto and Region Assessment Report, the CTC Source Protection Plan, or the Explanatory Document. The Amendments Working Group endorsed the amendments for submission to the Toronto and Region Source Protection Authority prior to being forwarded to the Ministry on November 30, 2018. Ministerial approval was granted on March 11, 2019 and the new plan and assessment reports came into effect on March 25, 2019. The Amendments Working Group was not convened for either the 2019 Alton or 2021 Aurora s.34 amendments as no policy changes were made as part of these updates. However, revisions to the Newmarket-Aurora WHPA made necessary a revision to the Downgradient Line (**Map 3.5**).

At CTC Source Protection Committee Meeting #1/22, held on February 15, 2022, the CTC Source Protection Committee endorsed amendments to Existing Threat Activity Definition, and DNAP-1, OS-1, Transition and Timeline Policies. On December 7, 2022, at CTC Source Protection Committee Meeting #4/22, members directed that ~~that~~ these policy revisions, along with technical updates for water supplies in Peel Region, City of Toronto and York Region, be incorporated into the CTC Source Protection

Plan and both the Toronto and Region and Credit Valley Assessment Reports, and proceed to consultation in 2023. Pre-consultation with implementing bodies is planned for March ~~/April/~~May 2023, and public consultation in June/July~~/August~~ 2023.

***The Environmental Protection Act*, 1990**

- Section 29 with respect to certificate of approval or provisional certificates of approval issued by the Director for the use, operation, establishment, alteration, enlargement or extension of waste disposal sites or waste management systems
- Section 47.5 with respect to renewable energy approvals issued or renewed by the Director

***The Nutrient Management Act*, 2002**

- Section 10 with respect to nutrient management strategies
- Section 14 with respect to nutrient management plans
- Section 28 with respect to approvals of nutrient management strategies or nutrient management plans
- Section 15.2 with respect to NASM plans

***The Ontario Water Resources Act*, 1990**

- Section 34 with respect to Permits to Take Water
- Section 53 with respect to approvals to establish, alter, extend or replace new or existing sewage works

***The Pesticides Act*, 1990**

- Sections 7 and 11 with respect to permits for land exterminations, structural exterminations and water exterminations issued by the Director

***The Safe Drinking Water Act*, 2002**

- Section 40 with respect to drinking water works permits issued by the Director
- Section 44 with respect to municipal drinking water licenses issued by the Director

## 9.2 RISK MANAGEMENT PLANS (PART IV TOOL, SECTION 58)

A Risk Management Plan (RMP) is a new tool introduced in the *Clean Water Act*, *2006* which sets out a plan to manage a threat activity in an area where it is, or could be, a significant drinking water threat, which may include responsibilities and protocols of the person engaged in the threat activity. Risk Management Plans are intended to be negotiated between a Risk Management Official (RMO) and a

person engaging in the threat activity. If agreement cannot be achieved, a RMP may be ordered, so that the user complies. The Risk Management Official must be satisfied that a RMP will reduce the potential for adverse effects to a drinking water source, so that the activity ceases to be, or does not become, a significant threat.

Note: Per direction provided by MECP, Risk Management Officials cannot amend or establish Risk Management Plans for activities that become new significant threats because of the 2021 Director's Technical Rules until after Assessment Report and the Source Protection Plan itself has been amended to align with the 2021 Rules, and the Source Protection Plan has taken effect.

## 9.3 PROHIBITION (PART IV TOOL, SECTION 57)

The Source Protection Committee may choose to prohibit certain activities, including existing activities which pose a particularly significant threat to drinking water sources, using another new tool introduced in the *Clean Water Act, 2006.* Prohibition of existing activities is meant to be a 'tool of last resort', meaning that the SPC may only do so if they are convinced no other method will reduce the risk, or the degree/level of risk that the activity poses is unacceptably high or severe that it may not be permitted to continue. The companion Explanatory Document to this SPP provides the rationale for the SPC's decisions to use these tools to address some existing significant drinking water threats.

## 9.4 RESTRICTED LAND USES (PART IV TOOL, SECTION 59)

Restricted Land Uses policies are complementary tools under the *Clean Water Act, 2006* which are used with either s.58 Risk Management Plans or s.57 Prohibition of activities. They do not eliminate a land use (and do not have the same meaning as in the *Planning Act, 1990*), but ensure that activities in the designated area are assessed by the RMO to ensure compliance with s.58 Risk Management Plan or s.57 Prohibition policies before the municipality issues a building permit or planning approvals. This tool acts as a screening tool for municipalities when reviewing applications, to prevent the unintentional approval of activities that are a significant threat to municipal drinking water.

### 10.1.2 Definitions

**Existing Threat Activity**

The CTC Source Protection Plan was approved by the Minister of the Environment and Climate Change on July 28, 2015 and became effective on December 31, 2015.

An existing threat activity shall mean the following, unless expressly stated in a policy:

a) an existing use, activity, building or structure at a location in a vulnerable area that is in compliance with all applicable requirements, and that was being used or had been established for the purposes of undertaking the threat activity, at any time within ten years prior to the date of approval of the Source Protection Plan or applicable amendment, or
b) an expansion of an existing use or activity that reduces the risk of contaminating drinking water nor depletes drinking water sources, or
c) an expansion, alteration or replacement of an existing building or structure that does not increase the risk of contaminating drinking water nor depletes drinking water sources.

For clarity, the definition of an existing threat activity includes a change in land ownership and the rotation of agricultural lands among crops or fallow conditions and allows for alternating between sources of nitrates (agricultural source material, commercial fertilizer, and Category 1 non-agricultural source material).

Future threat activities are anything not covered under existing.

**Transition**

Under the *Clean Water Act, 2006*, there is consideration for ~~source protection plans (~~SPPs~~)~~ to have a Transition Provision that outlines the circumstances under which a "future" drinking water threat activity, that would otherwise be prohibited, may be considered as "existing", even if the activity has not yet commenced. The intent is to allow applications in ~~transition~~progress to proceed while drinking water threats are managed under the "existing threat" policies.

The CTC Source Protection Committee included a Transition Provision to recognize situations where an approval-in-principle to proceed with a development application had already been obtained, or where a complete application was made prior to the date the SPP came into effect but requires further planning approvals to implement the application in progress.

~~The CTC SPP was approved by the Minister of Environment and Climate Change on July 28, 2015 and became effective on December 31, 2015.~~ Applications submitted after the effective date of the CTC SPP may only be transitioned if they are ~~helping to implement~~a necessary part of an application in process prior to the date the CTC SPP took effect.

"Existing Threat" policies apply to prescribed drinking water threat activities under the following circumstances:

1) A drinking water threat activity that is part of a development proposal where a ~~C~~complete ~~A~~application (as determined by the municipality or Niagara Escarpment Commission) was made under the *Planning Act*, *Condominium Act* or *Niagara Escarpment Planning and Development Act* (NEPDA) prior to ~~the day the Source Protection Plan comes into effect~~December 31, 2015. The policy for "existing" drinking water threats also applies to any further applications required under the *Planning Act*, *Condominium Act*, Prescribed Instruments, or a development permit under the NEPDA, to implement the development proposal.

2) A drinking water threat activity that is part of an application accepted for a Building Permit, which has been submitted in compliance with Division C 1.3.1.1 of the *Ontario Building Code* under the *Building Code Act, 1992* as amended prior to ~~the day the Source Protection Plan comes into effect~~December 31, 2015.

3) A drinking water threat activity that is part of an application accepted for the issuance or amendment of a Prescribed Instrument prior to December 31, 2015~~the day the Source Protection Plan comes into effect~~.

## Amendments

For vulnerable areas newly identified through an amendment to an Assessment Report, "Existing Threat" policies apply to prescribed drinking water threat activities under the following circumstances:

1) A drinking water threat activity that is part of a development proposal where a complete application (as determined by the municipality or Niagara Escarpment Commission) was made under the Planning Act, Condominium Act or Niagara Escarpment Planning and Development Act (NEPDA) prior to the effective date of the corresponding amendment identified below. The policy for "existing" drinking water threats also applies to any further applications required under the Planning Act, Condominium Act, Prescribed Instruments, or a development permit under the NEPDA, to implement the development proposal.
2) A drinking water threat activity that is part of an application accepted for a Building Permit, which has been submitted in compliance with Division C 1.3.1.1 of the Ontario Building Code under the Building Code Act, 1992 as amended prior to effective date of the corresponding amendment identified below.
3) A drinking water threat activity that is part of an application accepted for the issuance or amendment of a Prescribed Instrument prior to the effective date of the corresponding amendment identified below.

| Assessment Report | Version | Effective Date | Summary of Amendments |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Credit Valley Assessment Report | 2.0 | March 25, 2019 | Addition of Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Inglewood Drinking Water System |
| Credit Valley Assessment Report | 3.0 | December 5, 2019 | Addition of Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Alton Well 4A, Caledon Village – Alton Drinking Water System |
| Credit Valley Assessment Report | 5.0 | To be confirmed | Updated Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Caledon Village – Alton Drinking Water System |
| Toronto and Region Assessment Report | 3.0 | March 25, 2019 | Addition of Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Caledon East Drinking Water System |
| Toronto and Region Assessment Report | 4.0 | March 2, 2022 | Updated Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Newmarket-Aurora Drinking Water System |
| Toronto and Region Assessment Report | 6.0 | To be confirmed | Updated Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Palgrave-Caledon East Drinking Water System; Addition of New Intake Protection Zone, Vulnerability Assessment and EBA modelling for City of Toronto (Island) Drinking Water System; Addition of Wellhead Protection Area-A for Nobleton Drinking Water System |

### 10.1.3 Timelines for Implementation

The following table **(Table 10-1)** outlines the implementation timelines for the policies in the Source Protection Plan. In the policy tables organized by threat, the third column from the right called "When Policy Applies" contains a brief description of the timeline associated with the existing or future policy and the timeline code (i.e., T-1, T-2), that corresponds to the timelines outlined in the following table. These timeline policies **(Table 10-1)** provide greater detail on when the policy applies than the short reference contained within the threat specific policy. For threat activities (existing) added through amendments to an Assessment Report, timelines for policy implementation that reference the date the Source Protection Plan takes effect are interpreted to mean the effective date of the amendment to the Assessment Report, as described above.

**Table 10-1: Timelines for Policy Implementation**

| Policy ID | Timelines for Policy Implementation |
|---|---|
| **Prescribed Instruments** | |
| T-1 | Prescribed Instruments (existing) shall be reviewed (and amended, as necessary) within 3 years of the date the Source Protection Plan takes effect, or such other date as the Director determines. |
| T-2 | Prescribed Instruments (existing), where prohibited, shall not be renewed when the current Prescribed Instrument expires, and the significant threat activity to which the Prescribed Instrument pertains, shall cease no later than 5 years from the date the Source Protection Plan takes effect. |
| T-3 | The relevant Ministry shall comply with the Prescribed Instrument policy (future) immediately upon the date the Source Protection Plan takes effect. |
| **Part IV Tools** | |
| T-4 | Activities (existing) designated for the purpose of s.57 under the Clean Water Act as prohibited, shall be prohibited by the Risk Management Official within 180 days from the date the Source Protection Plan takes effect as per s.57(2) under the Clean Water Act, unless otherwise specified within the policy. |
| T-5 | Activities (future) designated for the purpose of s.57 under the Clean Water Act are prohibited immediately upon the date the Source Protection Plan takes effect. |
| T-6 | Activities (existing) designated for the purpose of s.58 under the Clean Water Act, requiring risk management plans, shall be identified and confirmed within 1 year by the Risk Management Official. Risk management plans shall be established by December 31, 2023. For activities (existing) added through amendments to an Assessment Report, a risk management plan must be established no later than 5 years from the effective date of the amended Assessment Report. |
| T-7 | Activities (future) designated for the purpose of s.58 under the Clean Water Act, requiring risk management plans, are prohibited until such time as a risk management plan is approved by the Risk Management Official, immediately upon the date the Source Protection Plan takes effect. |
| **Land Use Planning** | |
| T-8 | Official plans shall be amended for conformity with the Source Protection Plan at the time of the next review in accordance with s.26 of the Planning Act. Zoning by-laws shall be amended within 3 years after the approval of the official plan. |
| T-9 | Decisions on planning matters shall conform with the policy immediately upon the date the Source Protection Plan takes effect. |
| **Education and Outreach, Incentives, Research** | |
| T-10 | Education and outreach (materials, programs, etc.) shall be developed and implemented within 2 years from the date the Source Protection Plan takes effect. |
| T-11 | Incentives shall be considered within 2 years from the date the Source Protection Plan takes effect. |
| T-12 | Research shall be initiated within 2 years from the date the Source Protection Plan takes effect, contingent on funding. |
| **Specify Action** | |
| T-13 | A prioritized maintenance inspection program shall be in effect no later than January 2017. |
| T-14 | The policy shall be complied with within 180 days from the date the Source Protection Plan takes effect. |
| T-15 | The policy shall be considered within 2 years from the date the Source Protection Plan takes effect. |
| T-16 | The policy shall be initiated within 2 years from the date the Source Protection Plan takes effect. |
| T-17 | The policy shall be implemented within 2 years from the date the Source Protection Plan takes effect. |
| T-18 | The policy shall be implemented immediately upon the date the Source Protection Plan takes effect. |

~~*Note: in July 2020, the implementation deadline for SPP policy T-6 was extended by 3 years until Dec. 31, 2023.~~

**Table 10-2: When/where waste may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Threat Sub-Category | | Area and Vulnerability Score (VS) | Threat Classification Level | |
|---|---|---|---|---|
| | | | Significant | |
| 2009/2013/2017 DTR's | 2021 DTR's | | 2009/2013/ 2017 DTR's | 2021 DTR's |
| Application Of Untreated Septage To Land/Application Of Hauled Sewage To Land | 1.1 Disposal of Hauled Sewage to Land | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-E (VS=8, 8.1) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ |
| *Application Of Non-Agricultural Source Material (NASM) To Land (Including Treated Septage) or Biosolids to Land | 1.2 Application of Processed Organic Waste to Land | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-E (VS=8, 8.1) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ |
| Waste Disposal Site - Landfarming Of Petroleum Refining Waste | 1.3 Landfarming of Petroleum Refining Waste | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| Waste Disposal Site - Landfilling (Hazardous Waste) | 1.4 Landfilling (Hazardous Waste or Liquid Industrial Waste) | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-B/C (VS=8) | N/A | ✓ |
| | | ICA - Nitrates | N/A | ✓ |
| Waste Disposal Site - Landfilling (Municipal Waste) and Landfilling (Solid Non Hazardous Industrial or Commercial) | 1.5 Landfilling (Municipal Waste) | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-B/C (VS=8) | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ |
| Waste Disposal Site - Liquid Industrial Waste Injection into a well | 1.6 Liquid Industrial Waste Injection into a well | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-B/C (VS=8) | ✓ | ✓ |
| Waste Disposal Site - PCB Waste Storage | 1.7 PCB Waste Storage | WHPA-A/B (VS=10) | ✓ | ✓ |
| Threat category did not exist | 1.8 Storage of Hauled Sewage | WHPA-E (VS=9) | N/A | ✓ |
| | | WHPA-E (VS=8, 8.1) | N/A | ✓ |
| | | WHPA-A/B (VS=10) | N/A | ✓ |

| | | | | |
|---|---|---|---|---|
| | | ICA - Nitrates | N/A | ✓ |
| *Storage of Non-Agricultural Source Material (NASM) | 1.9 Storage of Processed Organic Waste or Waste Biomass | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-E (VS=8, 8.1) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ |
| Waste Disposal Site - Storage Of Hazardous Waste At Disposal Sites | 1.10 Transfer/Processing Sites approved to receive Hazardous Waste or Liquid Industrial Waste | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-E (VS=8, 8.1) | N/A | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-B/C (VS=8) | N/A | ✓ |
| Waste Disposal Site - Storage of wastes described in clauses (p), (q), (r), (s), (t) or (u) of the definition of hazardous waste | 1.11 Transfer/Processing Site approved to receive only Municipal Waste under Part V of the Environmental Protection Act | WHPA-E (VS=9) | N/A | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-B/C (VS=8) | N/A | ✓ |
| Threat category did not exist | 1.12 Storage of Subject Waste at a Waste Generation Facility: site requires O. Reg. 374 s.3 generator registration | WHPA-A/B (VS=10) | N/A | ✓ |
| Threat category did not exist | 1.13 Storage of Waste at a Waste Generation Facility: site exempt or excluded from generator registration requirements | WHPA-A/B (VS=10) | N/A | ✓ |
| Storage, Treatment And Discharge Of Tailings From Mines | 1.14 Storage, Treatment and Discharge of Tailings from Mines | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ |

DTR's refers to Director's Technical Rules
*In the 2009/2013/2017 DTR's, application and storage of Processed Organic Waste was addressed under NASM threat categories.

| ~~Prescribed Drinking Water Threat~~ | ~~Waste Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|

| | | |
|---|---|---|
| The establishment, operation, or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act* | Storage of hazardous or liquid industrial wastes (excluding those described in clauses (p), (q), (r), (s), (t) or (u) of the definition of hazardous waste) | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS = 9) |
| | Storage of wastes described in clauses (p), (q), (r), (s), (t) or (u) of the definition of hazardous waste | • WHPA-A<br>• WHPA-B (VS = 10) |
| | Application of untreated septage to land | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS ≥ 8)<br>• Anywhere in an ICA for Nitrates or Pathogens |
| | Storage, treatment, and discharge of tailings from mines | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS = 9) |
| | Landfarming of petroleum refining waste | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS = 9) |
| | Landfilling of hazardous waste | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS = 9) |
| | Landfilling of municipal waste or solid non-hazardous industrial or commercial waste | • WHPA-A<br>• WHPA-B (VS ≥ 8)<br>• WHPA-C (VS = 8)<br>• WHPA-E (VS = 9) |
| | Liquid industrial waste injection into a well | • WHPA-A<br>• WHPA-B (VS ≥ 8)<br>• WHPA-C (VS = 8) |
| | PCB waste storage | • WHPA-A<br>• WHPA-B (VS = 10) |

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**Table 10-3: When/where sewage may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat: The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage. | | | | | |
|---|---|---|---|---|---|
| Threat Sub-Category | | Area and Vulnerability Score (VS) | Threat Classification Level | | |
| | | | Significant | | |
| 2009/2013/2017 DTR's | 2021 DTR's | | 2009/ 2013 DTR's | 2017 DTR's | 2021 DTR's |
| Industrial Effluent Discharges | 2.1 Industrial Effluent Discharges | WHPA-E (VS=9) | ✓ | ✓ | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | N/A | N/A | ✓ |
| | | ICA - Nitrates and Chloride | ✓ | ✓ | ✓ |
| Septic System Holding Tank/Onsite Sewage Systems Holding Tank | 2.2 Onsite Sewage Works: Holding tanks | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | ICA – Nitrates | ✓ | ✓ | ✓ |
| | | ICA – Chloride and Sodium | ✓ | N/A- | N/A- |
| Septic System/Onsite Sewage Systems | 2.2 Onsite Sewage Works: Septic Systems | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |
| | | ICA - Chloride and Sodium | ✓ | N/A- | N/A- |
| Discharge Of Untreated Stormwater From A Stormwater Retention Pond/Discharge from a Stormwater Management Facility | 2.3 SWM facilities and drainage systems: Outfall from a storm water management facility or storm water drainage system | WHPA-E (VS=9) | ✓ | ✓ | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | ICA - Sodium | N/A- | N/A- | ✓ |
| | | ICA - Nitrates and Chloride | ✓ | ✓ | ✓ |
| | 2.4 SWM Facilities and Drainage Systems: Storm Water Infiltration Facility | WHPA-E (VS=9) | ✓ | ✓ | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ | ✓ | N/A- |
| | | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | ICA - Sodium | N/A- | N/A- | ✓ |
| | | ICA - Nitrates and Chloride | ✓ | ✓ | ✓ |
| Sanitary Sewers and related pipes | 2.5 WWCF and Associated Parts: Sanitary Sewers | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |

| | | | | | |
|---|---|---|---|---|---|
| | 2.7 WWCF and Associated Parts: Sewage Pumping Station or Lift Station Wet Well, a Holding Tank or a Tunnel | WHPA-E (VS=9) | N/A- | N/A- | ✓ |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |
| Combined Sewer discharge from a stormwater outlet to surface water | 2.6 WWCF and associated parts: Outfall of a combined sewer overflow (CSO), or a sanitary sewer overflow (SSO) from a manhole or wet well | WHPA-E (VS=9) | ✓ | ✓ | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | N/A- | N/A- | ✓ |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |
| Sewage treatment plant bypass discharge to surface water | 2.8 WWTF and Associated Parts: A final effluent outfall or a sewage treatment plant overflow outfall | WHPA-E (VS=9) | ✓ | ✓ | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | N/A- | N/A- | ✓ |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |
| Sewage Treatment Plant Effluent Discharges (Includes Lagoons) | 2.8 WWTF and Associated Parts: Sewage Lagoons | WHPA-E (VS=9) | ✓ | ✓ | N/A- |
| | | WHPA-E (VS=8.1 & 8) | ✓ | ✓ | N/A- |
| | | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |
| Storage Of Sewage (E.G. Treatment Plant Tanks)/Sewage Works Storage - Treatment or Holding Tanks | 2.8 WWTF and Associated Parts: A sewage treatment plant process tank or a sewage treatment plant holding tank | WHPA-E (VS=9) | ✓ | ✓ | ✓ |
| | | WHPA-A/B (VS=10) | ✓ | ✓ | ✓ |
| | | WHPA-B/C (VS=8) | ✓ | ✓ | N/A- |
| | | ICA - Nitrates | ✓ | ✓ | ✓ |

DTR's refers to Director's Technical Rules
SWM: Storm Water Management
WWCF: Wastewater Collection Facilities
WWTF: Wastewater Treatment Facilities

| ~~Prescribed Drinking Water Threat~~ | ~~Sewage Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|

| | | |
|---|---|---|
| The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage | Septic system | • WHPA-A<br>• WHPA-B (VS = 10)<br>• Anywhere in an ICA for Nitrates, Pathogens, Sodium* or Chloride*<br>*subject to the *Ontario Water Resources Act* only |
| | Septic system holding tank | • WHPA-A<br>• WHPA-B (VS = 10)<br>• Anywhere in an ICA for Nitrates, Pathogens, Sodium* or Chloride*<br>*subject to the *Ontario Water Resources Act* only |
| | Combined sewer discharge from a stormwater outlet to surface water | • WHPA-E (VS ≥ 8)<br>• Anywhere in a WHPA-E in an ICA for Nitrates or Pathogens |
| | A storm water management facility designed to discharge storm water to land or surface water | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS ≥ 8)<br>• Anywhere in an ICA for Nitrates, Pathogens or Chloride |
| | Industrial effluent discharges | • WHPA-E (VS ≥ 8)<br>• Anywhere in a WHPA-E in an ICA for Nitrates, Pathogens or Chloride |
| | Sanitary sewers and related pipes | • WHPA-A<br>• WHPA-B (VS = 10)<br>• Anywhere in an ICA for Nitrates or Pathogens |
| | Sewage treatment plant bypass discharge to surface water | • WHPA-E (VS ≥ 8)<br>• Anywhere in an ICA for Nitrates or Pathogens |
| | Sewage treatment plant effluent discharges (Includes lagoons) | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS ≥ 8)<br>• Anywhere in an ICA for Nitrates or Pathogens |
| | Storage of sewage (e.g., treatment plant tanks) | • WHPA-A<br>• WHPA-B (VS ≥ 8)<br>• WHPA-C (VS = 8)<br>• WHPA-E (VS = 9)<br>• Anywhere in an ICA for Nitrates or Pathogens |

*Tables of Drinking Water Threats* it is a significant drinking water threat irrespective of vulnerability score.

**Table 10-4: When/where ASM may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub Category | Area and Vulnerability Score (VS) | Threat Classification Level: Significant 2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The application of agricultural source material to land | Application Of Agricultural Source Material (ASM) To Land | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ |
| | | ICA - Nitrates | ✓ |
| The storage of agricultural source material | Storage Of Agricultural Source Material (ASM) | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ |
| | | ICA - Nitrates | ✓ |
| The management of agricultural source material | Management of Agricultural Source Material – Aquaculture/Discharge from Aquaculture | Cannot be significant within CTC | |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~ASM Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The application, storage and management of agricultural source material~~ | ~~The application of agricultural source material to land~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 8)~~<br>~~• Anywhere in an ICA for Nitrates or Pathogens~~ |
| | ~~The storage of agricultural source material~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 8)~~<br>~~• Anywhere in an ICA for Nitrates or Pathogens~~ |
| | ~~The management of agricultural source material – aquaculture~~ | ~~• Anywhere in WHPA-E in an ICA for Pathogens~~ |

assessment of NASM storage sites, considered the geographic location, whether the storage facility is temporary or permanent, the source of the material, and whether the material is stored above or below grade.

See **Table 10-5** for when and where application and storage of NASM may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat. These activities may also be significant drinking water threats anywhere within an Issue Contributing Area (ICA) for nitrates or pathogens. There are not currently any Issue Contributing Areas for pathogens within the CTC Source Protection Region. If the activity meets the description of circumstances in the *Tables of Drinking Water Threats* it is a significant drinking water threat irrespective of vulnerability score.

**Table 10-5: When/where NASM may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level<br>Significant<br>2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The application of non-agricultural source material to land | Application Of Non-Agricultural Source Material (NASM) or Biosolids To Land (Including Treated Septage)/Application of Non-Agricultural Source Material (NASM) | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ |
| | | ICA - Nitrates | ✓ |
| The handling and storage of non-agricultural source material | Storage of Non-Agricultural Source Material (NASM)/Handling and Storage of Non-Agricultural Source Material (NASM) | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ |
| | | ICA - Nitrates | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~NASM Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|

| | | |
|---|---|---|
| The application, handling, and storage of non-agricultural source material to land | The application of non-agricultural source material to land (including treated septage) | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS ≥ 8)<br>• Anywhere in an ICA for Nitrates or Pathogens |
| | The storage of non-agricultural source material | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS ≥ 8)<br>• Anywhere in an ICA for Nitrates or Pathogens |

See **Table 10-6** for when and where livestock may be a significant drinking water threat.

Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat. These activities may also be significant drinking water threats anywhere within an Issue Contributing Area (ICA) for Nitrates or Pathogens. There are not currently any Issue Contributing Areas for pathogens within the CTC Source Protection Region. If the activity meets the description of circumstances in the *Tables of Drinking Water Threats* it is a significant drinking water threat irrespective of vulnerability score.

**Table 10-6: When/where livestock may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level: Significant 2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard. O. Reg. 385/08, s. 3. | Agricultural Source Material (ASM) Generation - Livestock Grazing or Pasturing | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ |
| | | ICA - Nitrates | ✓ |
| | Agricultural Source Material (ASM) Generation - Outdoor Confinement Area (OCA) or Farm Animal Yard | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | WHPA-E (VS=8.1 & 8) | ✓ |
| | | ICA - Nitrates | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Livestock Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard~~ | ~~The use of land as livestock grazing or pasturing land~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 8)~~<br>~~• Anywhere in an ICA for Nitrates or Pathogens~~ |
| | ~~The use of land as an outdoor confinement area or a farm-animal yard~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 8)~~<br>~~• Anywhere in an ICA for Nitrates or Pathogens~~ |

livestock density in the vulnerable area and where the fertilizer is applied. The potential threat to drinking water from the storage of fertilizer depends on the location, type of facility where it is stored, and the quantity stored.

See **Table 10-7** for when and where application and storage of commercial fertilizer may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat. These activities may also be significant drinking water threats anywhere within an Issue Contributing Area (ICA) for Nitrates. If the activity meets the description of circumstances in the *Tables of Drinking Water Threats* it is a significant drinking water threat irrespective of vulnerability score.

**Table 10-7: When/where commercial fertilizer may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level Significant 2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The application of commercial fertilizer to land | Application of Commercial Fertilizer to Land | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |
| | | ICA-Nitrates | ✓ |
| The handling and storage of commercial fertilizer | Storage Of Commercial Fertilizer/Handling and Storage of Commercial Fertilizer | WHPA-A/B (VS=10) | ✓ |
| | | ICA-Nitrates | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Commercial Fertilizer Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|

| | | |
|---|---|---|
| The application, handling, and storage of commercial fertilizer | The application of commercial fertilizer to land | • WHPA-A<br>• WHPA-B (VS = 10)<br>• WHPA-E (VS = 9)<br>• Anywhere in an ICA for Nitrates |
| | The storage of commercial fertilizer | • WHPA-A<br>• WHPA-B (VS = 10)<br>• Anywhere in an ICA for Nitrates |

These substances are herbicides except for dichloropropene-1, 3, which is a nematicide (used to control nematodes) and Metalaxyl, which is a fungicide. Other pesticides are not considered to be drinking water threats.

Pesticide has historically been applied to agricultural, recreational, institutional, industrial, commercial, and residential land uses. Since 2009, there has been a ban on the cosmetic use of pesticide in Ontario on lawns, vegetable and ornamental gardens, patios, driveways, cemeteries, parks, and school yards. The major uses for pesticide will continue to be in agriculture and on golf courses.

The assessment of potential threats to drinking water sources from the application of commercial pesticide to land is dependent on the area of land to which the pesticide is applied: less than 1 hectare; between 1 and 10 hectares; or greater than 10 hectares. In general, the greater the application area, the greater the risk to drinking water. The assessment of potential threats to drinking water sources from the handling and storage of pesticide is dependent on the location, the type of storage (whether at a facility where it is manufactured or processed, or at a facility for retail sale or extermination), and the amount of pesticide stored.

See **Table 10-8** for when and where application, handling and storage of pesticides may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat.

**Table 10-8: When/where pesticide may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level<br>Significant<br>2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The application of pesticide to land | Application of Pesticide to Land | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |

| | | | |
|---|---|---|---|
| | | WHPA-E (VS=8.1) | ✓ |
| The handling and storage of pesticide | Storage Of A Pesticide/Handling and Storage of a Pesticide | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Pesticide Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The application, handling, and storage of pesticide~~ | ~~The application of pesticide to land~~ | ~~WHPA-A~~<br>~~WHPA-B (VS = 10)~~<br>~~WHPA-E (VS ≥ 8.1)~~ |
| | ~~The handling and storage of pesticide~~ | ~~WHPA-A~~<br>~~WHPA-B (VS = 10)~~<br>~~WHPA-E (VS ≥ 9)~~ |

See **Table 10-9** for when and where the application, handling and storage of road salt may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat. These activities may also be significant drinking water threats anywhere within an Issue Contributing Area (ICA) for Sodium or Chloride. If the activity meets the description of circumstances in the *Tables of Drinking Water Threats* it is a significant drinking water threat irrespective of vulnerability score.

**Table 10-9: When/where road salt may be a significant drinking water threat in CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level: Significant | |
|---|---|---|---|---|
| | | | 2009/2013/2017 DTR's | 2021 DTR's |
| The application of road salt | Application of Road Salt | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-E (VS=9) | ✓ | ✓ |
| | | ICA - Sodium & Chloride | ✓ | ✓ |
| The handling and storage of road salt | Storage of Road Salt/Handling and Storage of Road Salt - Exposed to Precipitation or Runoff | WHPA-A/B (VS=10) | N/A | ✓ |
| | | WHPA-E (VS=9) | | ✓ |
| | | ICA - Sodium & Chloride | | ✓ |
| | Storage of Road Salt/Handling and Storage of Road Salt - Potentially Exposed to Precipitation or Runoff | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-E (VS=9) | ✓ | N/A |
| | | ICA - Sodium & Chloride | ✓ | ✓ |
| | Storage of Road Salt/Handling and Storage | WHPA-A/B (VS=10) | N/A | N/A |

| | | | | |
|---|---|---|---|---|
| | of Road Salt - Not Exposed to Precipitation or Runoff | WHPA-E (VS=9) | N/A | N/A |
| | | ICA - Sodium & Chloride | ✓ | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Road Salt Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The application, handling, and storage of road salt~~ | ~~The application of road salt~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 9)~~<br>~~• Anywhere in an ICA for Sodium or Chloride~~ |
| | ~~The storage of road salt~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 9)~~<br>~~• Anywhere in an ICA for Sodium or Chloride~~ |

This threat is closely linked to the application, handling, and storage of road salt, because snow is able to pick up the salt that has been applied to roads. A reduction in the amount of salt applied to roads and parking areas could reduce the amount of road salt that contaminates snow. The main source of sodium, chloride and cyanide in snow is road salt; the other contaminants are generally from vehicle fluids, exhaust, brake linings, and tire and engine wear. The assessment of the threat from a snow storage area is dependent on its specific location (vulnerability score) to drinking water sources, whether the snow is stored above or below grade, and the size of the storage area. In general, the greater the snow storage area (and therefore the volume of snow stored), the greater the risk to drinking water.

See **Table 10-10** for when and where the storage of snow may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat. These activities may also be significant drinking water threats anywhere within an Issue Contributing Area (ICA) for Sodium or Chloride. If the activity meets the description of circumstances in the *Tables of Drinking Water Threats* it is a significant drinking water threat irrespective of vulnerability score.

**Table 10-10: When/where snow may be a significant drinking water threat within CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level: Significant | |
|---|---|---|---|---|
| | | | 2009/2013/2017 DTR's | 2021 DTR's |
| The storage of snow | Storage Of Snow/Storage of Snow on a Site | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-E (VS=9) | ✓ | ✓ |
| | | WHPA-E (VS=8.1 & 8) | N/A | ✓ |
| | | ICA - Sodium & Chloride | ✓ | ✓ |
| | | ICA - Nitrates | ✓ | N/A |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Snow Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The storage of snow~~ | ~~The storage of snow~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~ |

| | | |
|---|---|---|
| | | ~~• WHPA-E (VS ≥ 9)~~<br>~~• Anywhere in an ICA for Sodium or Chloride~~ |

The Ministry of the Environment, Conservation and Parks' *Tables of Drinking Water Threats* identifies the following chemicals as potential concerns:

- Benzene, Toluene, Ethylbenzene and Xylene (referred to as BTEX)
- Petroleum hydrocarbons F1 to F4 (referred to as PHC)

BTEX compounds have strong odours and tastes, which generally discourages any accidental consumption of drinking water. However, benzene is a known carcinogen, and some research has suggested that ethylbenzene may be carcinogenic and produce birth defects. BTEX is a non-aqueous phase liquid that does not easily dissolve into water and persists in the environment. It can lead to contamination of groundwater over a long period of time and the BTEX contaminated water can travel over long distances. Petroleum hydrocarbons can cause an array of negative health effects to the reproductive, respiratory, immune, and nervous systems and can also harm the kidneys, liver, skin, eyes, and blood. PHCs may also affect the odour, taste, and appearance of water. The assessment of potential threats to drinking water sources from handling and storage of fuel is dependent on the location; the chemicals of concern in the fuel; whether it is stored above, below, or partially below grade; the type of facility where it is stored; and the quantity stored.

See **Table 10-11** for when and where the handling and/or storage of fuel may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat.

**Table 10-11: When/where fuel may be a significant drinking water threat within CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level | |
|---|---|---|---|---|
| | | | Significant | |
| | | | 2009/2013 DTR's | 2017/2021 DTR's |
| The handling and storage of fuel | Handling/Storage/Handling and Storage of Fuel | WHPA-A/B (VS=10) | ✓ | ✓ |
| | | WHPA-E (VS=9) | N/A | ✓ |

DTR's refers to Director's Technical Rules

| Prescribed Drinking Water Threat | Fuel Threat Sub-Category | Area and Vulnerability Score (VS) |
|---|---|---|
| The handling and storage of fuel | The handling of fuel | • WHPA-A<br>• WHPA-B (VS = 10) |
| | The storage of fuel | • WHPA-A<br>• WHPA-B (VS = 10) |

## 10.10 DENSE NON-AQUEOUS PHASE LIQUID (DNAPL) AND ORGANIC SOLVENT

### Definition of DNAPLs

The handling and storage of a dense non-aqueous phase liquid (DNAPL) is a prescribed drinking water threat under O. Reg. 287/07 under the *Clean Water Act, 2006*.

A DNAPL is an organic liquid that is denser than water and tends to be insoluble in water, meaning that it does not mix with water. When released into the environment, DNAPLs sink through to the bottom of groundwater aquifers (until they hit bedrock, for example) as well as through surface water bodies. However, after 'sinking', a DNAPL will continue to flow through the ground, at which time it will only then start to mix with water. Water that is contaminated with DNAPLs can spread over a number of kilometres and persist over a long period of time, as DNAPLs can be present in the aquifer for decades or centuries before they have been completely depleted. This accounts for their 'special' status in Source Water Protection evaluation (i.e., the fact that they are considered to be a significant threat in the 5-year time of travel zone or WHPA-C).

DNAPLs have been readily used in vast quantities for decades in industrial and commercial applications such as dry cleaning, cleaning/degreasing solvents, electronics, aerosols, plastics, pesticides, pharmaceuticals, wood preservation, asphalt operations, varnishes and the repair of motor vehicles and equipment. These chemicals can also be found in small quantities in common household products such as adhesives and cleaners. 'Handling' of DNAPLs is not specifically defined in regulations.

### Why are DNAPLs a Threat to Drinking Water Sources?

A number of chemicals from the handling and storage of DNAPLs could make their way into drinking water sources. The Ministry of the Environment, Conservation and Parks' *Tables of Drinking Water Threats (2009)* identifies the following sub-threat activities:

- The handling of a DNAPL (see circumstances #102-111)
- The storage of a DNAPL (see circumstances #1098-1112)

The Ministry of the Environment, Conservation and Parks' *Tables of Drinking Water Threats* identify the specific chemicals that could make their way from DNAPL handling and storage into drinking water sources, which include:

- Dioxane-1,4 (a stabilizer)
- Polycyclic aromatic hydrocarbons (PAHs)
- Tetrachloroethylene (also known as Perchloroethylene or PCE) (dry cleaning solvent, de-grease metals, paint strippers)
- Trichloroethylene (TCE) (industrial applications)
- Vinyl chloride (VC) (polymer production)

There is no minimum quantity for a DNAPL – any amount of a DNAPL is considered a significant drinking water threat in specific vulnerable areas.

See **Table 10-12** for when and where the handling and/or storage of a DNAPL may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat.

**Table 10-12: When/where a DNAPL may be a significant drinking water threat within CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level: Significant | |
|---|---|---|---|---|
| | | | 2009/2013/2017 DTR's | 2021 DTR's |
| The handling and storage of a dense non-aqueous phase liquid | Handling/Storage/ Handling and Storage of a Dense Non-Aqueous Phase Liquid (DNAPL) | WHPA-A/B/C (VS = Any Score) | ✓ | ✓ |
| | | WHPA-E (VS = 9) | N/A | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~DNAPL Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|

| | | |
|---|---|---|
| The handling and storage of a dense non-aqueous phase liquid | The handling of a dense non-aqueous phase liquid | • WHPA-A<br>• WHPA-B<br>• WHPA-C |
| | The storage of a dense non-aqueous phase liquid | • WHPA-A<br>• WHPA-B<br>• WHPA-C |

### Definition of Organic Solvents

The handling and storage of an organic solvent is a prescribed drinking water threat under O. Reg. 287/07 under the *Clean Water Act, 2006*.

Organic solvents are liquid organic compounds (i.e., containing carbon) with the power to dissolve solids, gases, or liquids. Most organic solvents have a lower density than water, which means they are lighter and will sit as a separate layer on top of water. Organic solvents have been readily used in vast quantities for decades in industrial and commercial applications such as paints, cleaning/degreasing, dry cleaning, electronics, aerosols, plastics, pesticides, pharmaceuticals, wood preservation, asphalt operations, varnishes and the repair of motor vehicles and equipment. Organic solvents can also be found in small quantities in common household products such as cleaners.

### Why are Organic Solvents a Threat to Drinking Water Sources?

Chemicals from organic solvents could make their way into drinking water sources. The Ministry of the Environment, Conservation and Parks' *Tables of Drinking Water Threats (2009)* identifies the following sub-threat activity:

- The handling and storage of an organic solvent (see circumstances #1225-1272)

The Ministry of the Environment, Conservation and Parks' *Tables of Drinking Water Threats* identify the following four chemicals that could make their way from the handling and storage of organic solvents into water sources, which include:

- Carbon tetrachloride
- Chloroform
- Dichloromethane
- Pentachlorophenol

The assessment of potential threats to drinking water sources from the handling and storage of organic solvents is dependent on the location; the chemicals of concern in the solvent; where it is stored above, below, or partially below grade; and the quantity stored.

See **Table 10-13** for when and where the handling and/or storage of an organic solvent may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat.

**Table 10-13: When/where an organic solvent may be a significant drinking water threat within CTC (2009/2013/2017/2021) Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level<br>Significant<br>2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The handling and storage of an organic solvent | Storage Of An Organic Solvent/Handling and Storage of an Organic Solvent | WHPA-A/B (VS=10) | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Organic Solvent Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The handling and storage of an organic solvent~~ | ~~The handling and storage of an organic solvent~~ | ~~• WHPA-A<br>• WHPA-B (VS = 10)~~ |

| Policy ID | Threat Description | Implementing Body | Legal Effect | Policy | Where Policy Applies | When Policy Applies | Related Policies | Monitoring Policy |
|---|---|---|---|---|---|---|---|---|
| **DNAP-1** | Handling and Storage of a Dense Non-Aqueous Phase Liquid | RMO | G | **Part IV, s.57, s.58**<br><br>Where the handling and storage of a DNAPL is, or would be, a significant drinking water threat, the following actions shall be taken:<br><br>1) a) The handling and storage of a DNAPLs of a total in any quantity greater than of 250 L or greater (excluding incidental quantities for personal use) is designated for the purpose of s.57 under the *Clean Water Act*, and is therefore prohibited where the threat would be significant in any of the following areas:<br>• WHPA-A (future); or<br>• WHPA-B (future); or<br>• WHPA-C (future); or<br>• WHPA-E (future).<br><br>b) The handling and storage of DNAPLs of a total greater than 25 L but less than 250L, is designated for the purposes of s.57 under the *Clean Water Act*, and is therefore prohibited where the threats would be significant in any of the following areas:<br>• WHPA-A (future) | See Maps 2.1 - 2.21 | Future: Immediately (T-5) | GEN-1 | MON-2 |
| | | | H | 2) a) The handling and storage of a DNAPLs of a totalin any quantity greater than of 25 L or greater (excluding incidental quantities for personal use) is designated for the purpose of s.58 under the *Clean Water Act*, requiring risk management plans, where the threat is significant in any of the following areas:<br>• WHPA-A (existing); or<br>• WHPA-B (existing); or<br>• WHPA-C (existing); or<br>• WHPA-E (existing)<br><br>b) The handling and storage of DNAPLs of a total quantity greater than 25 L but not moreless than 250 L, is designated for the purpose of s.58 under the *Clean Water Act*, requiring risk management plans, where the threat would be significant in any of the following areas:<br>• WHPA-B (future); or<br>• WHPA-C (future); or | | Existing: 1 year/ 5 years (T-6) | GEN-1<br>GEN-2 | MON-2 |

| Policy ID | Threat Description | Implementing Body | Legal Effect | Policy | Where Policy Applies | When Policy Applies | Related Policies | Monitoring Policy |
|---|---|---|---|---|---|---|---|---|
| | | | | • WHPA-E (future). | | | | |

| Policy ID | Threat Description | Implementing Body | Legal Effect | Policy | Where Policy Applies | When Policy Applies | Related Policies | Monitoring Policy |
|---|---|---|---|---|---|---|---|---|
| **DNAP-2** | Handling and Storage of a Dense Non-Aqueous Phase Liquid | Municipality<br><br>MECP | E<br><br>K | **Education and Outreach**<br><br>The municipality shall deliver education and outreach materials and programs where the handling and storage of a DNAPL is, or would be, a significant drinking water threat, targeted towards:<br><br>a) an individual for personal use to promote the use of non-toxic products and additional opportunities for participation in household hazardous waste disposal and to advise the owner/tenant about the actions to take to ensure that the activity ceases to be, or does not become, a significant drinking water threat; and<br><br>b) industrial and commercial users to promote the use of alternatives to DNAPLs (including non-toxic products), pollution prevention approaches, best management practices, and safe disposal; in any of the following areas:<br>• WHPA-A (existing, future); or<br>• WHPA-B (existing, future); or<br>• WHPA-C (existing, future)<br>Where appropriate education and outreach materials prepared by the Ministry of the Environment, Conservation and Parks are available, the municipality shall deliver those materials. | See Maps 2.1 - 2.21 | Existing & Future: Implement within 2 years (T-10) | GEN-8 | MON-1<br><br>MON-4 |
| **DNAP-3** | **Moderate/ Low Threats**<br><br>Handling and Storage of a Dense Non-Aqueous Phase Liquid | Municipality | J | **Specify Action**<br><br>Where the handling and storage of a DNAPL is, or would be, a moderate or low drinking water threat, the municipality is encouraged to specify and promote best management practices for the handling and storage of a DNAPL for Industrial, Commercial and Institutional (ICI) land uses in any of the following areas:<br>• WHPA-D (existing, future); or<br>• WHPA-E (VS ≥ 4.8 and <10) (existing, future); or<br>• HVA (existing, future). | See Chapter 5 of the respective Assessment Report | Existing & Future: Consider within 2 years (T-15) | N/A | N/A |

| Policy ID | Threat Description | Implementing Body | Legal Effect | Policy | Where Policy Applies | When Policy Applies | Related Policies | Monitoring Policy |
|---|---|---|---|---|---|---|---|---|
| **OS-1** | Handling and Storage of an Organic Solvent | RMO | G | **Part IV, s.57, s.58**<br><br>Where the handling and storage of an organic solvent is, or would be, a significant drinking water threat, the following actions shall be taken:<br><br>1) a) The handling and storage of an organic solvent is designated for the purpose of s.57 under the *Clean Water Act*, and is therefore prohibited where the threat would be significant in ~~any of~~ the following area~~s~~:<br>• WHPA-A (future)~~; or~~.<br>~~• WHPA-B (VS =10) (future).~~<br><br>b) The handling and storage of an organic solvent of a total quantity greater than 250L, is designated for the purposes of s.57 under the *Clean Water Act*, and is therefore prohibited where the threat would be significant in the following area:<br>• WHPA-B (VS=10) (future) | See Maps 1.1 - 1.21 | Future: Immediately (T-5) | GEN-1 | MON-2 |
| | | | H | 2) a) The handling and storage of an organic solvent is designated for the purpose of s.58 under the *Clean Water Act*, requiring risk management plans, where the threat is significant in any of the following areas:<br>• WHPA-A (existing); or<br>• WHPA-B (VS=10) (existing).<br><br>b) The handling and storage of an organic solvent of a total quantity greater than 25L but not more than 250 L, is designated for the purpose of s.58 under the *Clean Water Act*, requiring risk management plans, where the threat would be significant in the following area:<br>• WHPA-B (VS=10) (future) | | Existing: 1 year/ 5 years (T-6) | GEN-1<br>GEN-2 | MON-2 |

| Policy ID | Threat Description | Implementing Body | Legal Effect | Policy | Where Policy Applies | When Policy Applies | Related Policies | Monitoring Policy |
|---|---|---|---|---|---|---|---|---|
| **OS-2** | Handling and Storage of an Organic Solvent | Municipality<br><br>MECP | E<br><br>K | **Education and Outreach**<br><br>The municipality shall deliver education and outreach materials and programs where the handling and storage of an organic solvent is, or would be, a significant drinking water threat, targeted towards:<br><br>a) an individual for personal use to promote the use of non-toxic products and additional opportunities for participation in household hazardous waste disposal and to advise the owner/tenant about the actions to take to ensure that the activity ceases to be, or does not become, a significant drinking water threat; and<br><br>b) industrial and commercial users to promote the use of alternatives to these chemicals (including non-toxic products), pollution prevention approaches, best management practices, and safe disposal; in any of the following areas:<br>• WHPA-A (existing, future); or<br>• WHPA-B (VS = 10) (existing, future).<br><br>Where appropriate education and outreach materials prepared by the Ministry of the Environment, Conservation and Parks are available, the municipality shall deliver those materials. | See Maps 1.1 - 1.21 | Existing & Future: Implement within 2 years (T-10) | GEN-8 | MON-1<br><br>MON-4 |
| **OS-3** | **Moderate/ Low Threats**<br><br>Handling and Storage of an Organic Solvent | Municipality | J | **Specify Action**<br><br>Where the handling and storage of an organic solvent is, or would be, a moderate or low drinking water threat, the municipality is encouraged to specify and promote best management practices for the handling and storage of an organic solvent for Industrial, Commercial and Institutional (ICI) land uses in any of the following areas:<br>• WHPA-B (VS < 10) (existing, future); or<br>• WHPA-C (existing, future); or<br>• WHPA-D (existing, future); or<br>• WHPA-E (VS ≥ 4.8 and <10) (existing, future); or<br>• HVA (existing, future). | See Chapter 5 of the respective Assessment Report | Existing & Future: Consider within 2 years (T-15) | N/A | N/A |

See **Table 10-14** for when and where the management of runoff that contains chemicals used in the de-icing of aircraft may be a significant drinking water threat. Note: to determine if a specific activity is a significant drinking water threat consult the *Tables of Drinking Water Threats* for the specific circumstances that must be met for the activity to be a threat.

**Table 10-14: When/where the management of runoff that contains chemicals used in the de-icing of aircraft may be a significant drinking water threat within CTC (2009/2013/2017/2021 Table of Drinking Water Threats)**

| Prescribed Drinking Water Threat | Threat Sub-Category | Area and Vulnerability Score (VS) | Threat Classification Level<br>Significant<br>2009/2013/2017/2021 DTR's |
|---|---|---|---|
| The management of runoff containing chemicals used in the de-icing of aircraft | Management of Runoff Containing Chemicals Used in The De-icing of Aircrafts | WHPA-A/B (VS=10) | ✓ |
| | | WHPA-E (VS=9) | ✓ |

DTR's refers to Director's Technical Rules

| ~~Prescribed Drinking Water Threat~~ | ~~Aircraft De-Icing Threat Sub-Category~~ | ~~Area and Vulnerability Score (VS)~~ |
|---|---|---|
| ~~The management of runoff containing chemicals used in the de-icing of aircrafts~~ | ~~The management of runoff containing chemicals used in the de-icing of aircrafts~~ | ~~• WHPA-A~~<br>~~• WHPA-B (VS = 10)~~<br>~~• WHPA-E (VS ≥ 9)~~ |

### 10.12.3 Sewage

#### Waste Water Treatment Plant (WWTP) Disinfection Failure

Modelling scenarios were undertaken to determine if disinfection failures at waste water treatment plants would cause deterioration of the quality of raw water above the normal range observed at the nearby municipal drinking water intakes. The modelled parameter of concern for these scenarios was *E. coli* and the recreational standard for *E. coli* (100 colony forming units per 100 millilitres (CFU/100 ml)) was selected by the SPC as the threshold to identify a significant drinking water threat. The scenarios were modelled for each waste water treatment plant using a series of wind and lake current conditions normally found in the vicinity of the facilities. These were not extreme weather conditions. The model was used to simulate the contaminant pathway within Lake Ontario and to determine the concentrations of the contaminant at the intakes. More details on this work can be found in each of Assessment Reports for the CTC Source Protection Areas.

As part of the proposed 2023 section 34 amendment to the CTC Source Protection Plan and Toronto and Region Assessment Report, focused lake modelling was conducted for the new Ashbridges Bay Treatment Plant outfall and the City of Toronto Island Water Treatment Plant potable water intakes.

#### Sanitary Trunk Sewer Breaks

A series of scenarios were modelled to determine if a large trunk sewer break along the shoreline of Lake Ontario could result in *E. coli* levels above the normal range observed at the nearby municipal drinking water intakes. Four trunk sewer break locations were modelled within the Toronto and Region Source Protection Area. The modelled parameter of concern for these scenarios was *E. coli* and the recreational standard for *E. coli* (100 colony forming units per 100 millilitres (CFU/100ml)) was selected by the SPC as the threshold to identify a significant drinking water threat. The scenarios were modelled for each waste water treatment plant using a series of wind and lake current conditions normally found in the vicinity of the facilities. These were not extreme weather conditions. The model was used to simulate the contaminant pathway within Lake Ontario and to determine the concentrations of the contaminant at the intakes. More details on this work can be found in each of Assessment Reports for the CTC Source Protection Areas.

# 11 LIST OF ACRONYMS

| | |
|---|---|
| **ASM** | Agricultural Source Material |
| **BCA** | *Building Code Act, 1992* |
| **BMP** | Best Management Practices |
| **Bq** | Becquerel |
| **BTEX** | Benzene, Toluene, Ethylbenzene and Xylene |
| **CA** | Conservation Authority |
| **C of A** | Certificate of Approval (now called an Environmental Compliance Approval) |
| **CFU** | Colony Forming Units |
| **CLOSPA** | Central Lake Ontario Source Protection Area |
| **CTC** | Credit Valley-Toronto and Region-Central Lake Ontario |
| **CVSPA** | Credit Valley Source Protection Area |
| **CWA** | *Clean Water Act, 2006* |
| **DNAPL** | Dense Non-Aqueous Phase Liquid |
| **DTR's** | Director's Technical Rules |
| **EBA** | Event Based Area |
| **ECA** | Environmental Compliance Approval (formerly called Certificate of Approval) |
| **EPA** | *Environmental Protection Act, 1990* |
| **GUDI** | Groundwater Under the Direct Influence of Surface Water |
| **HVA** | Highly Vulnerable Aquifer |
| **ICA** | Issue Contributing Area |
| **IPZ** | Intake Protection Zone |
| **LID** | Low Impact Development |
| **LOC** | Lake Ontario Collaborative |
| **LOCG** | Lake Ontario Collaborative Group |
| **LUP** | Land Use Planning |
| **MECP** | Ministry of the Environment, Conservation and Parks |
| **MGCS** | Ministry of Government and Consumer Services |

**Development (as defined by the Provincial Policy Statement, 2014)**

Means the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*, but does not include:

a) activities that create or maintain *infrastructure* authorized under an environmental assessment process;

b) works subject to the *Drainage Act*; or

c) underground or surface mining of *minerals* or advanced exploration on mining lands in *significant areas of mineral potential* in Ecoregion 5E, where advanced exploration has the same meaning as under the *Mining Act*.

**Director's Technical Rules (also Technical Rules, Rules, and DTR's)**

The rules established under section 107 of the *Clean Water Act, 2006*, that establishes requirements relating to risk assessments, risk management plans and any matter that is authorized or required to be included in an assessment report. These ~~R~~rules were first released in 2008, and are amended from time to time (e.g. 2009, 2013, 2017, 2021).

**Drinking Water Issue**

A substantiated (through scientific means) condition relating to the quality of water that interferes or is anticipated to soon interfere with the use of a drinking water source by a municipal residential system or designated system.

**Drinking Water Threat**

An existing activity, possible future activity or existing condition that results from a past activity that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water.

**Environmental Compliance Approval (ECA)**

A new approval that has replaced the Certificate of Approval (C of A) and the section 53 Ontario Water Resources Act (OWRA) approvals. This change came into effect October 31, 2011.

**Event**

The occurrence of an incident (isolated or frequent) with the potential to promote the introduction of a threat into the environment. An event can be intentional as in the case of licensed discharge or accidental as in the case of a spill.

**Event Based Area (EBA)**

See Chapters 7.1.3 and 10.12 for more information.

**Existing Drinking Water Source**

The aquifer or surface water body from which municipal residential systems or other designated systems currently obtain their drinking water. This includes the aquifer or surface water body from which back-up wells or intakes for municipal residential systems or other designated systems obtain their drinking water when their current source is unavailable or in the event of an emergency.

**Groundwater**

Subsurface water that occurs beneath the water table in soils and geological formations that are fully saturated.

**Groundwater Recharge Area**

The area where an aquifer is replenished from (a) natural processes, such as the infiltration of rainfall and snowmelt and the seepage of surface water from lakes, streams, and wetlands, (b) from human interventions, such as the use of storm water management systems, and (c) whose recharge rate exceeds a threshold specified in the regulations. The Director's Technical ~~r~~Rules ~~will~~ specify the acceptable methodologies to determine groundwater recharge rates i.e., what qualifies as significant.

**Hazard**

In the context of this guidance, a hazard is equivalent to a contaminant and pathogen threat.

**Hazard Rating**

The numeric value which represents the relative potential for a contaminant of concern to impact drinking water sources at concentrations significant enough to cause human illness. This numeric value is determined for each contaminant of concern in the Threats Inventory and Issues Evaluation of the Assessment Report.

**Highly Vulnerable Aquifer (HVA)**

An aquifer that can be easily changed or affected by contamination from both human activities and natural processes as a result of (a) its intrinsic susceptibility, as a function of the thickness and permeability of overlaying layers, or (b) by preferential pathways to the aquifer. The Director's Technical ~~r~~Rules ~~will~~ permit the use of various methods, such as the Intrinsic Susceptibility Index (ISI), to determine those aquifers that are highly vulnerable. Ontario's ISI defines a highly vulnerable aquifer as having a value of less than 30. An ISI is a numerical indicator that helps to indicate where contamination of groundwater is more or less likely to occur as a result of surface contamination due to natural hydrogeological features. The ISI is the most commonly used method of index mapping and was the prescribed method set out in the provincial 2001/2002 Groundwater Studies.

**Hydrogeology**

Hydrogeology is the study of the movement and interactions of groundwater in geological materials.

**Hydrologic Integrity**

The condition of ecosystems in which hydrological features and hydrological functions are unimpaired by stresses from human activity.

**Impervious**

Not allowing something to pass through or penetrate. Impervious surfaces are mainly artificial structures such as paved roads, sidewalks, driveways, and parking lots.

**Incidental Quantities for Personal Use**

Means standard size containers that are used for personal or domestic activities. This will exclude larger quantities used in activities, such as hobbies, businesses/home businesses.

**Intake Protection Zone (IPZ)**

The contiguous area of land and water immediately surrounding a surface water intake, which includes:

- the distance from the intake;
- a minimum travel time of the water associated with the intake of a municipal residential system or other designated system, based on the minimum response time for the water treatment plant operator to respond to adverse conditions or an emergency;
- the remaining watershed area upstream of the minimum travel time area (also referred to as the Total Water Contributing Area) – applicable to inland water courses and inland lakes only.

## APPENDIX F: MAPS OF THREAT AREAS WHERE POLICIES APPLY

The following maps are organized by location of vulnerable area:

**HALTON REGION**



**YORK REGION**



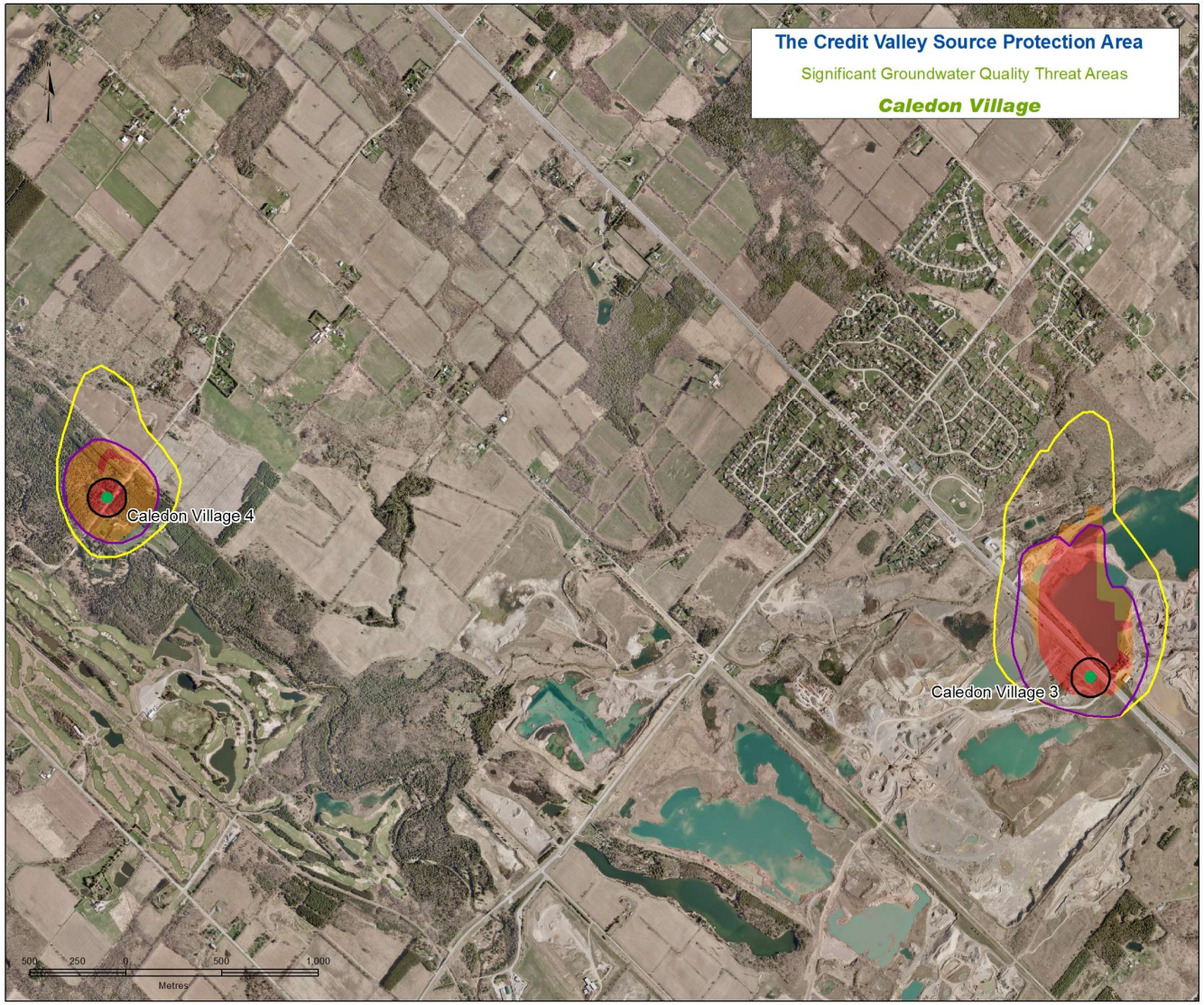
**DURHAM REGION**



**LAKE ONTARIO**



**CTC REGION**




**Legend**

WHPA - C
WHPA - B
WHPA - A
Wellhead

WHPA areas with Vulnerability Score = 10
WHPA areas with Vulnerability Score = 8

Source Protection Area (SPA) Boundary

Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)



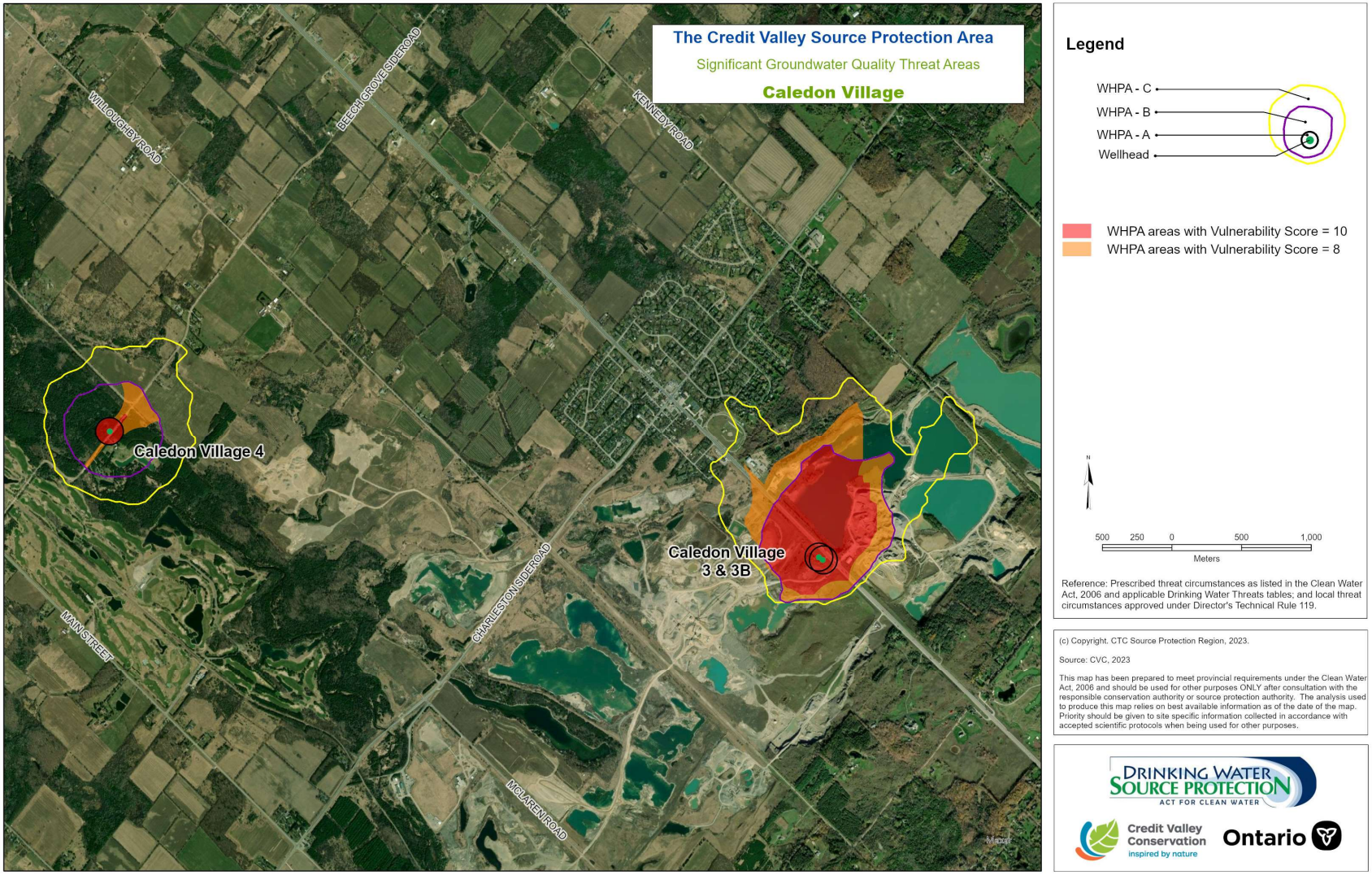
Source: TRCA, 2011; First Base Solutions, 2011.

This map has been prepared to meet provincial requirements under the Clean Water Act, 2006 and should be used for other purposes ONLY after consultation with the responsible conservation authority or source protection authority. The analysis used to produce this map relies on best available information as of the date of the map. Priority should be given to site specific information collected in accordance with accepted scientific protocols when being used for other purposes.

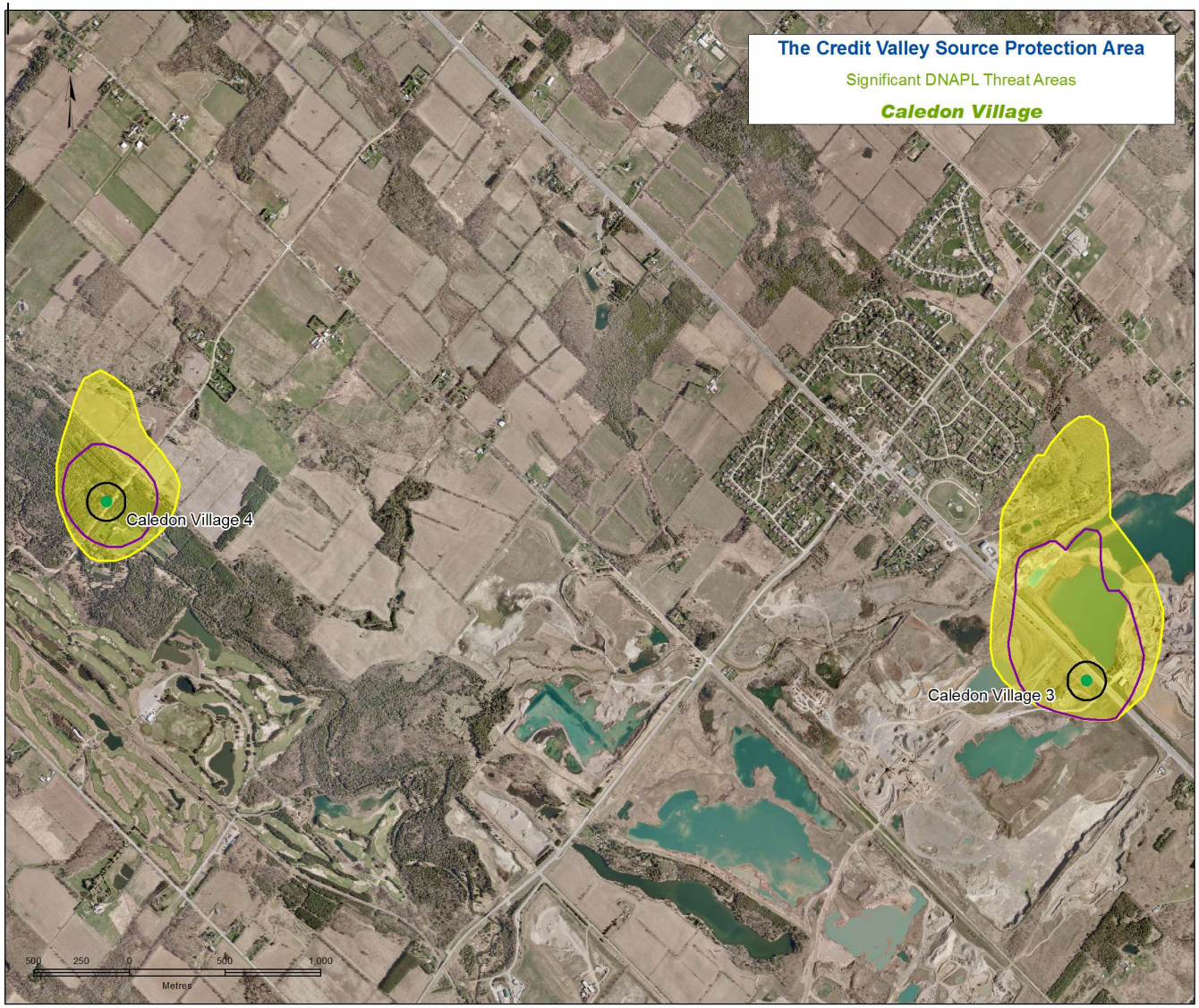
DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

CVC

Ontario




**Map 1.8: Caledon Village – Significant Groundwater Quality Threat Areas**




**Legend**

WHPA - C
WHPA - B
WHPA - A
Wellhead

Dense Non-Aqueous Phase Liquids

Source Protection Area (SPA) Boundary

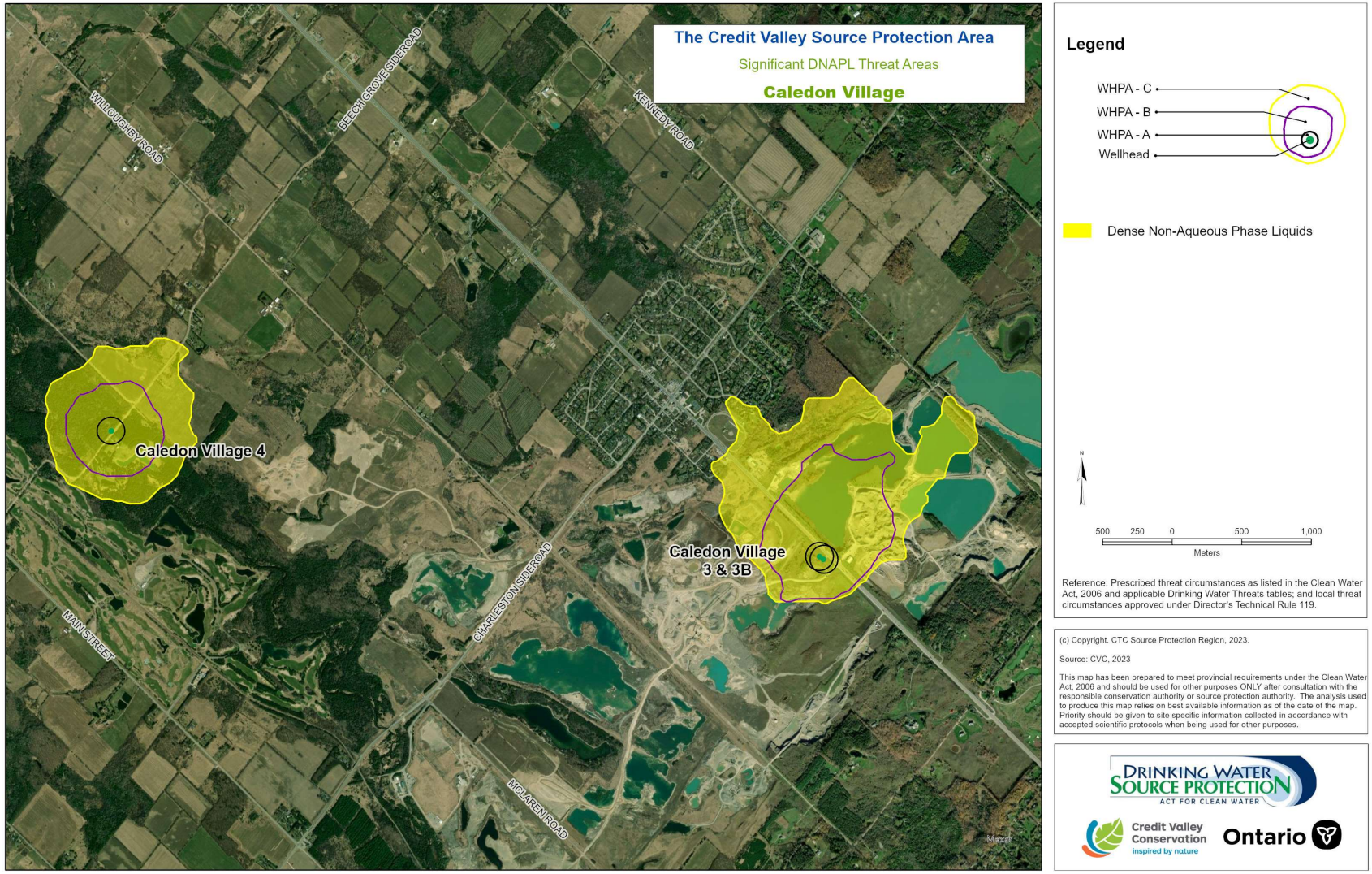
Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)



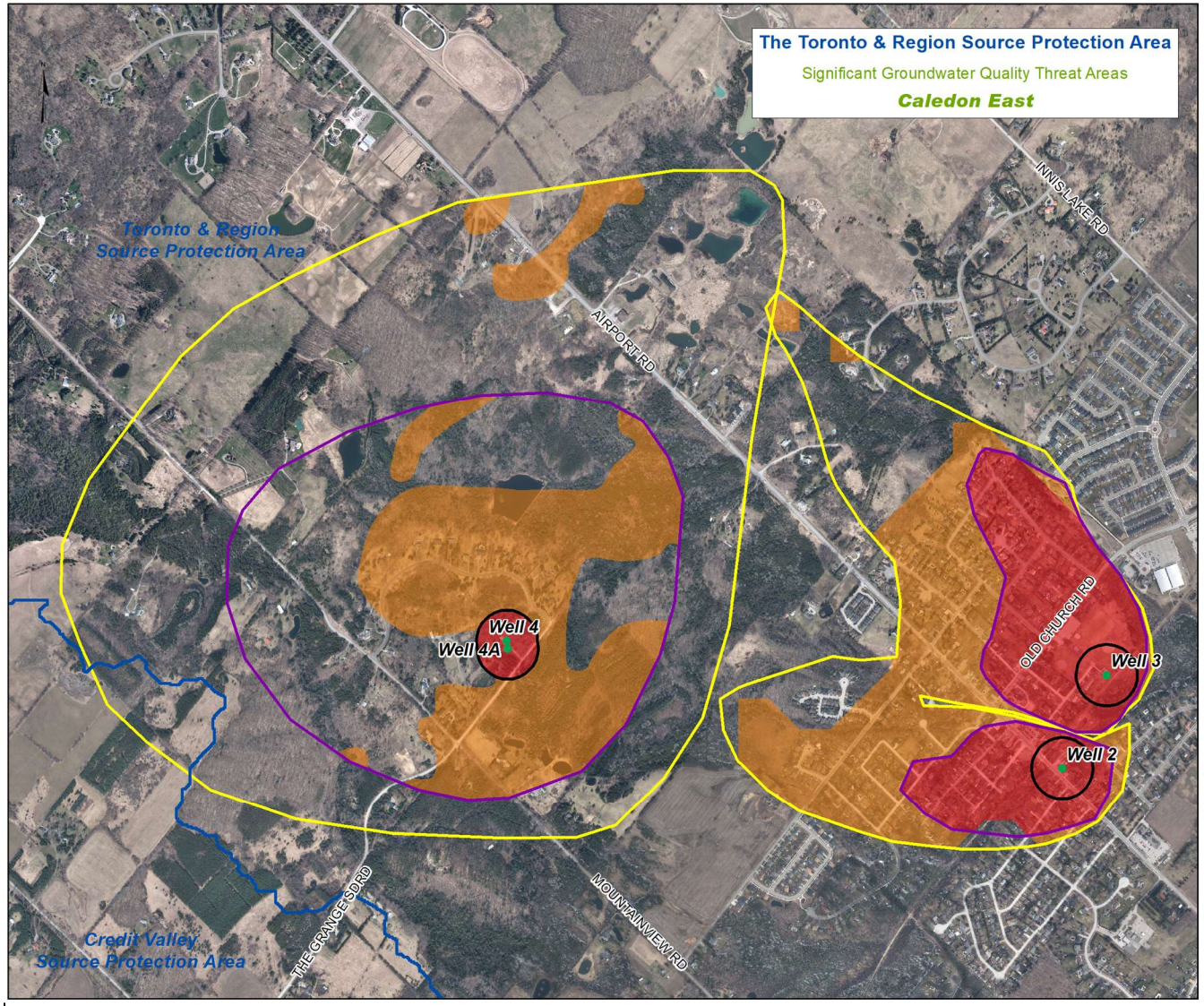
Source: TRCA, 2011; First Base Solutions, 2011.

This map has been prepared to meet provincial requirements under the Clean Water Act, 2006 and should be used for other purposes ONLY after consultation with the responsible conservation authority or source protection authority. The analysis used to produce this map relies on best available information as of the date of the map. Priority should be given to site specific information collected in accordance with accepted scientific protocols when being used for other purposes.

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER
CVC
Ontario




**Map 2.8: Caledon Village – Significant DNAPL Threat Areas**




**Legend**

WHPA - C
WHPA - B
WHPA - A
Wellhead

WHPA areas with Vulnerability Score = 10
WHPA areas with Vulnerability Score = 8

Source Protection Area (SPA) Boundary

500 250 0 500
Metres

Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)

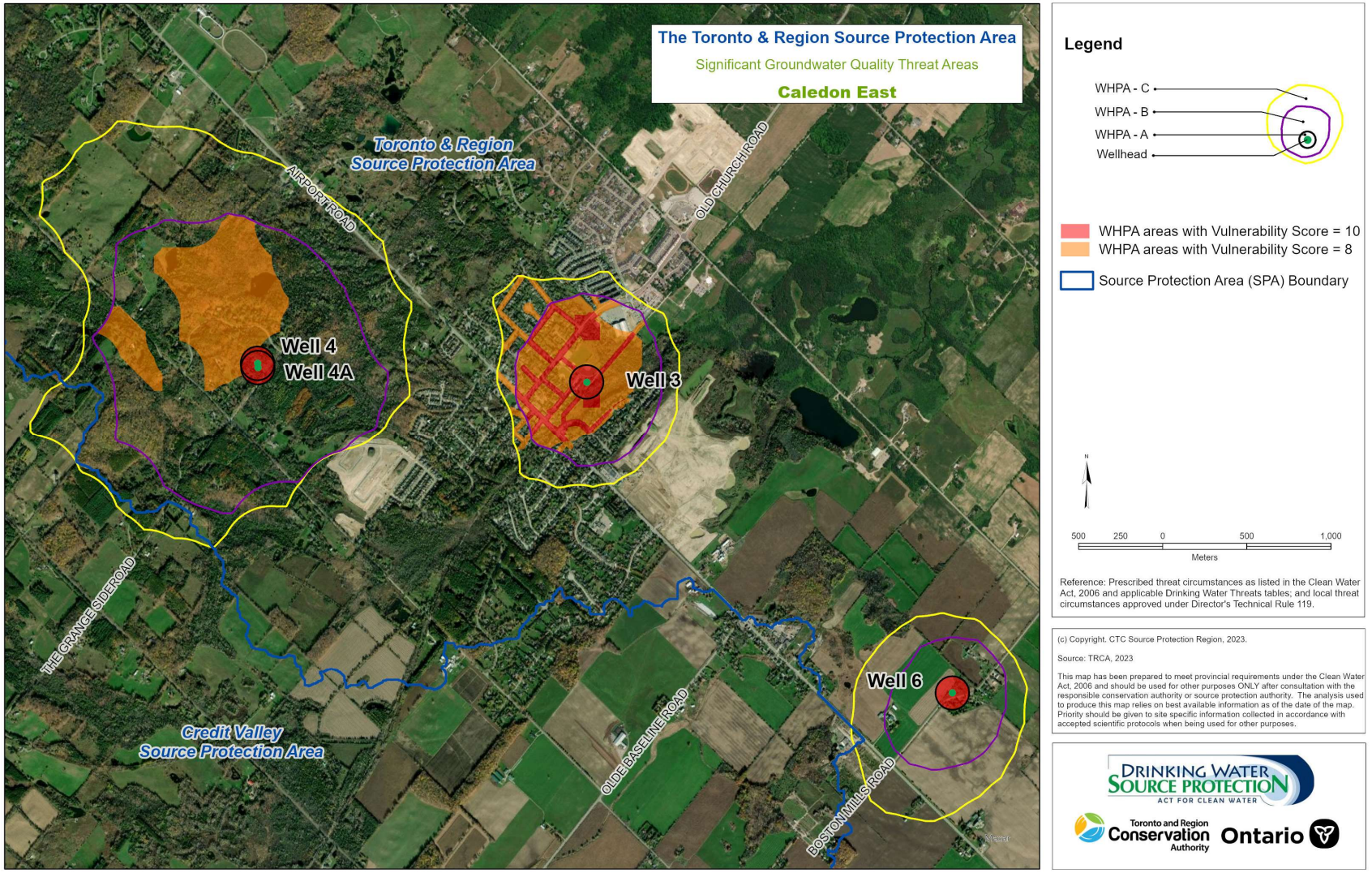


Source: TRCA, 2018; First Base Solutions, 2017.

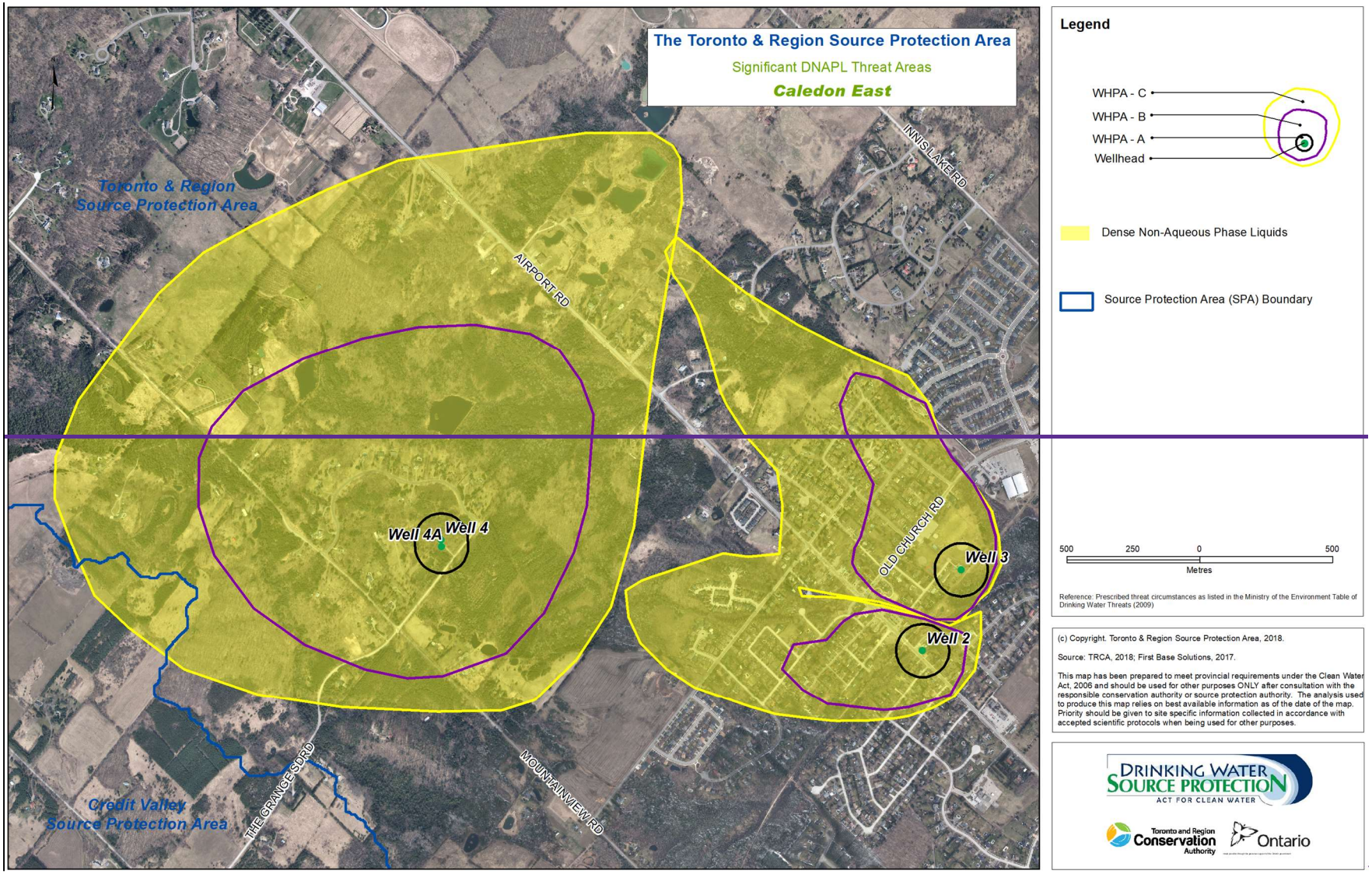
This map has been prepared to meet provincial requirements under the Clean Water Act, 2006 and should be used for other purposes ONLY after consultation with the responsible conservation authority or source protection authority. The analysis used to produce this map relies on best available information as of the date of the map. Priority should be given to site specific information collected in accordance with accepted scientific protocols when being used for other purposes.

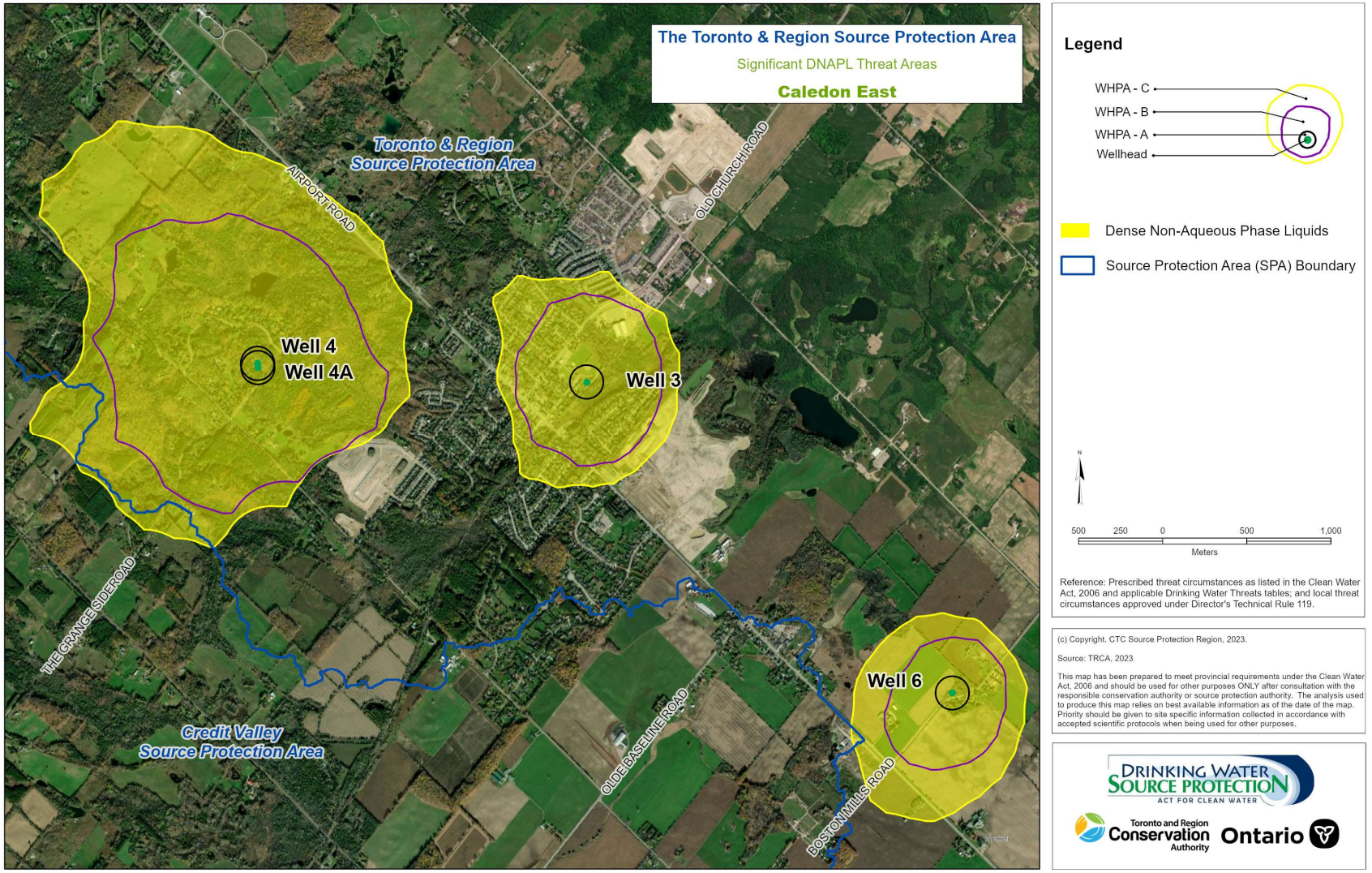
DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Toronto and Region Conservation Authority
Ontario

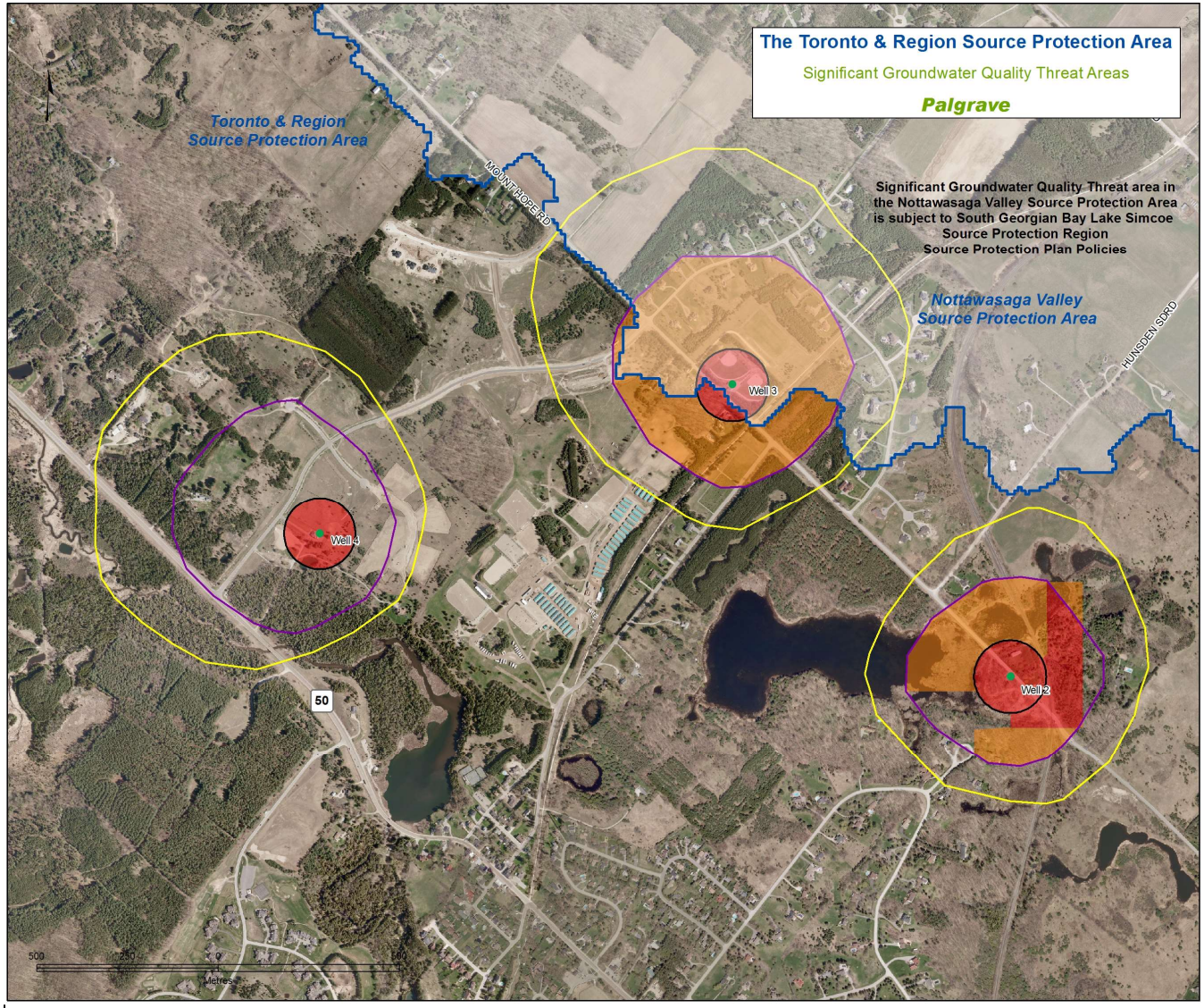



**Map 1.11: Caledon East – Significant Groundwater Quality Threat Areas**


The Toronto & Region Source Protection Area
Significant DNAPL Threat Areas
Caledon East
Toronto & Region Source Protection Area
Credit Valley Source Protection Area
AIRPORT RD
INNIS LAKE RD
OLD CHURCH RD
THE GRANGE SDRD
MOUNTAINVIEW RD
Well 4A
Well 4
Well 3
Well 2
Legend
WHPA - C
WHPA - B
WHPA - A
Wellhead
Dense Non-Aqueous Phase Liquids
Source Protection Area (SPA) Boundary
500 250 0 500
Metres
Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)
(c) Copyright. Toronto & Region Source Protection Area, 2018.
Source: TRCA, 2018; First Base Solutions, 2017.
This map has been prepared to meet provincial requirements under the Clean Water Act, 2006 and should be used for other purposes ONLY after consultation with the responsible conservation authority or source protection authority. The analysis used to produce this map relies on best available information as of the date of the map. Priority should be given to site specific information collected in accordance with accepted scientific protocols when being used for other purposes.
DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER
Toronto and Region Conservation Authority
Ontario




**Map 2.11: Caledon East – Significant DNAPL Threat Areas**




**Legend**

WHPA - C
WHPA - B
WHPA - A
Wellhead

WHPA areas with Vulnerability Score = 10
WHPA areas with Vulnerability Score = 8

Source Protection Area (SPA) Boundary

Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)



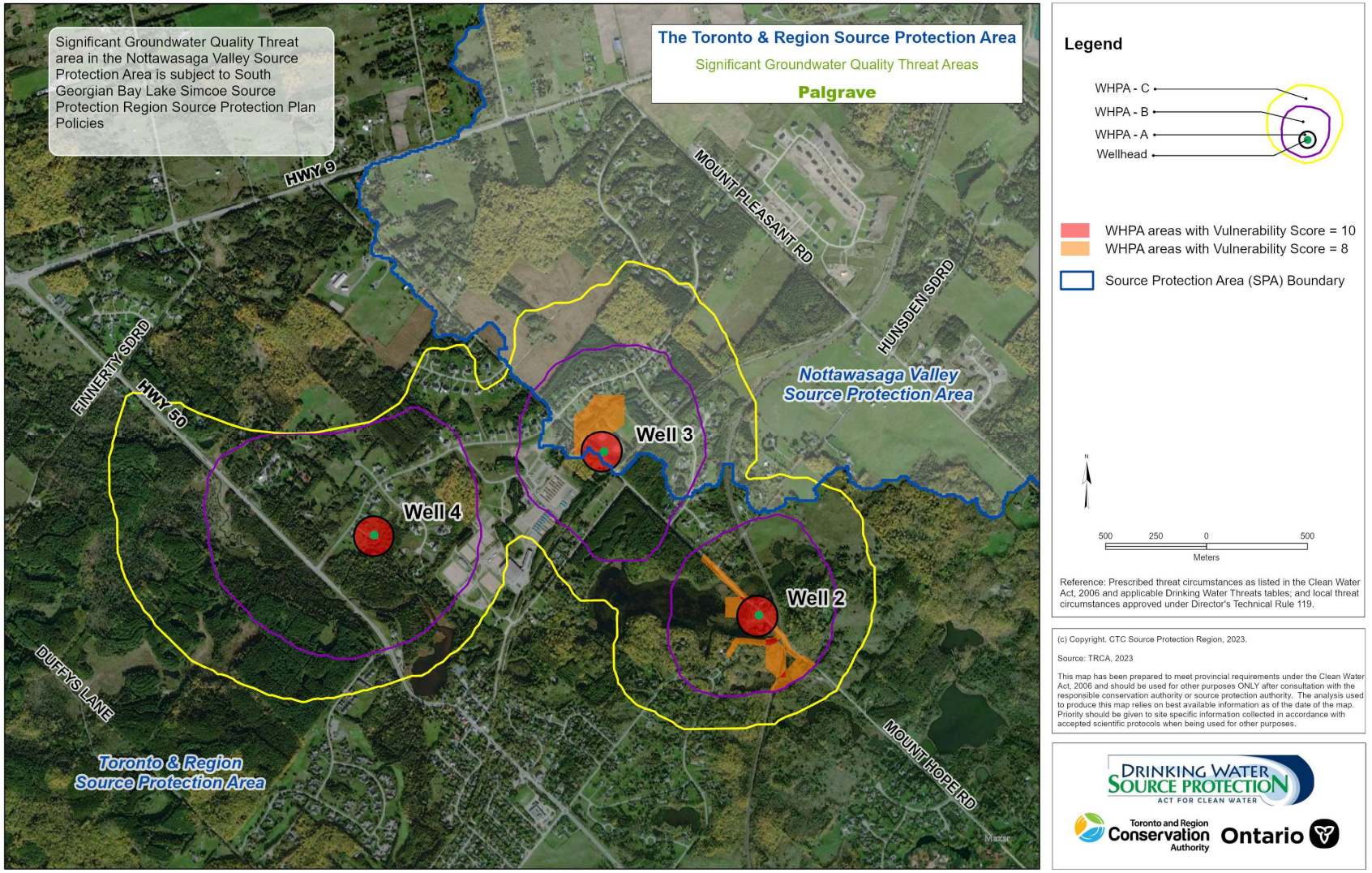
Source: TRCA, 2014; First Base Solutions, 2011.

This map has been prepared to meet provincial requirements under the Clean Water Act, 2006 and should be used for other purposes ONLY after consultation with the responsible conservation authority or source protection authority. The analysis used to produce this map relies on best available information as of the date of the map. Priority should be given to site specific information collected in accordance with accepted scientific protocols when being used for other purposes.

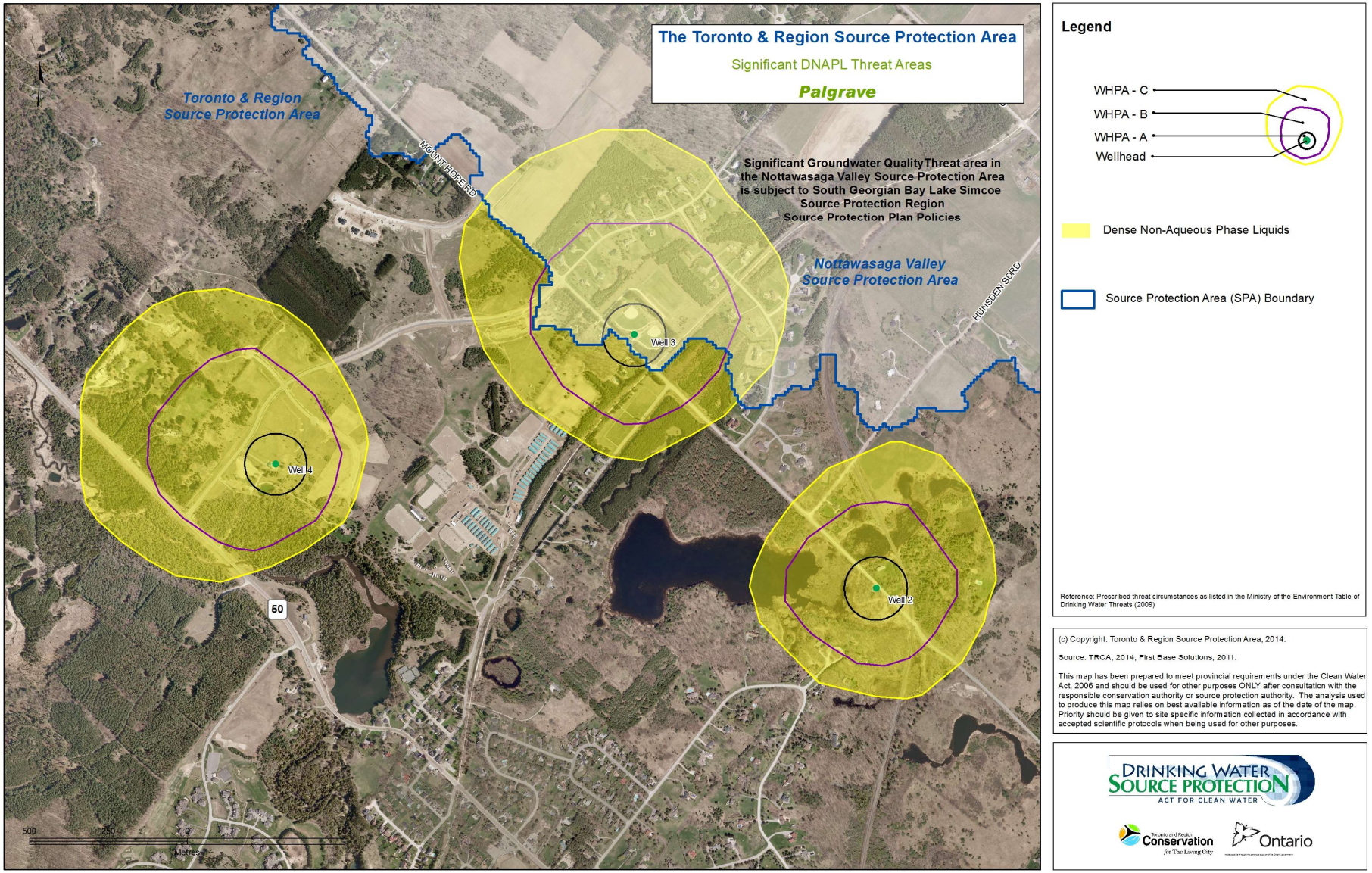
DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

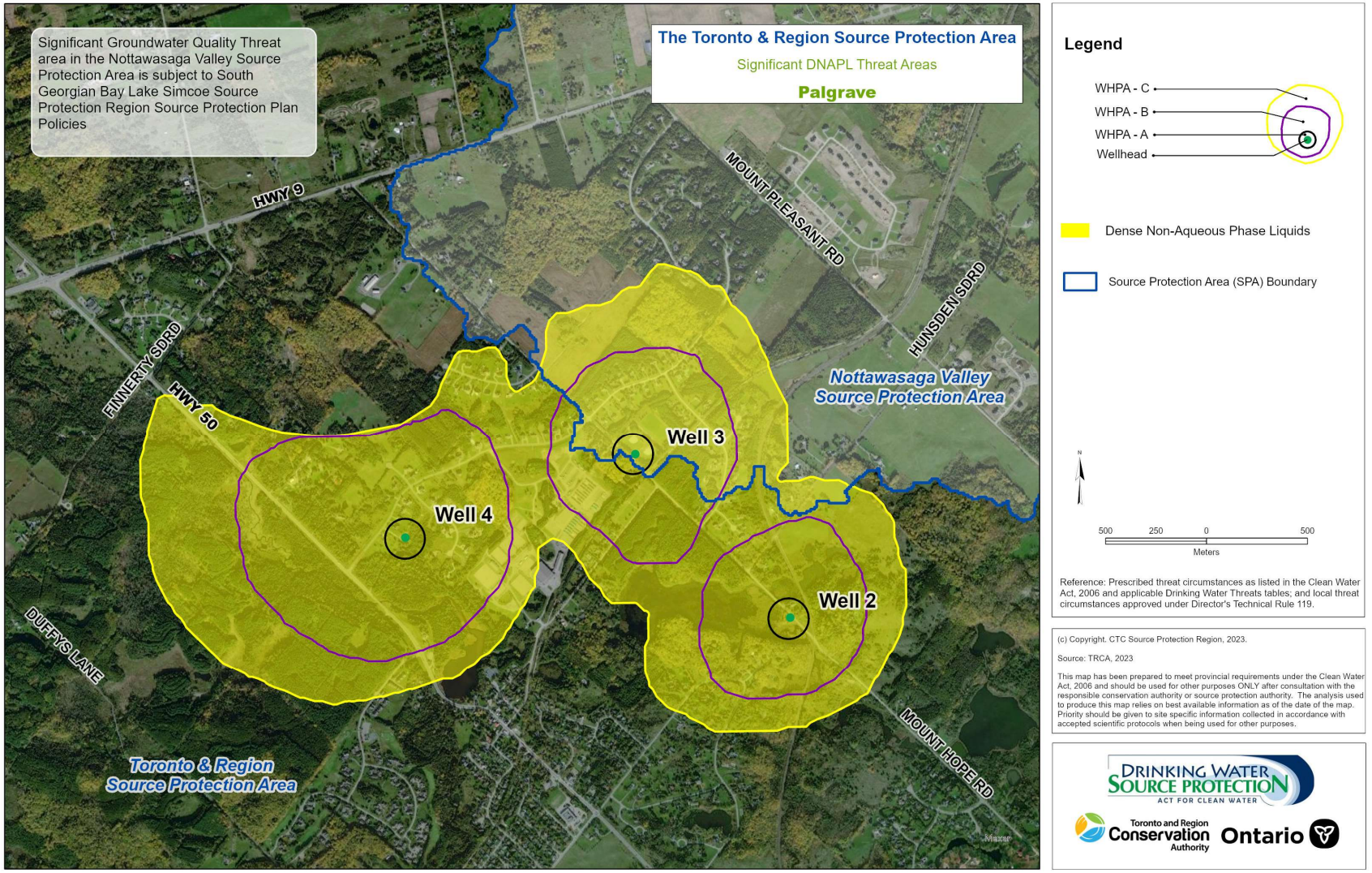
Toronto and Region Conservation for The Living City

Ontario

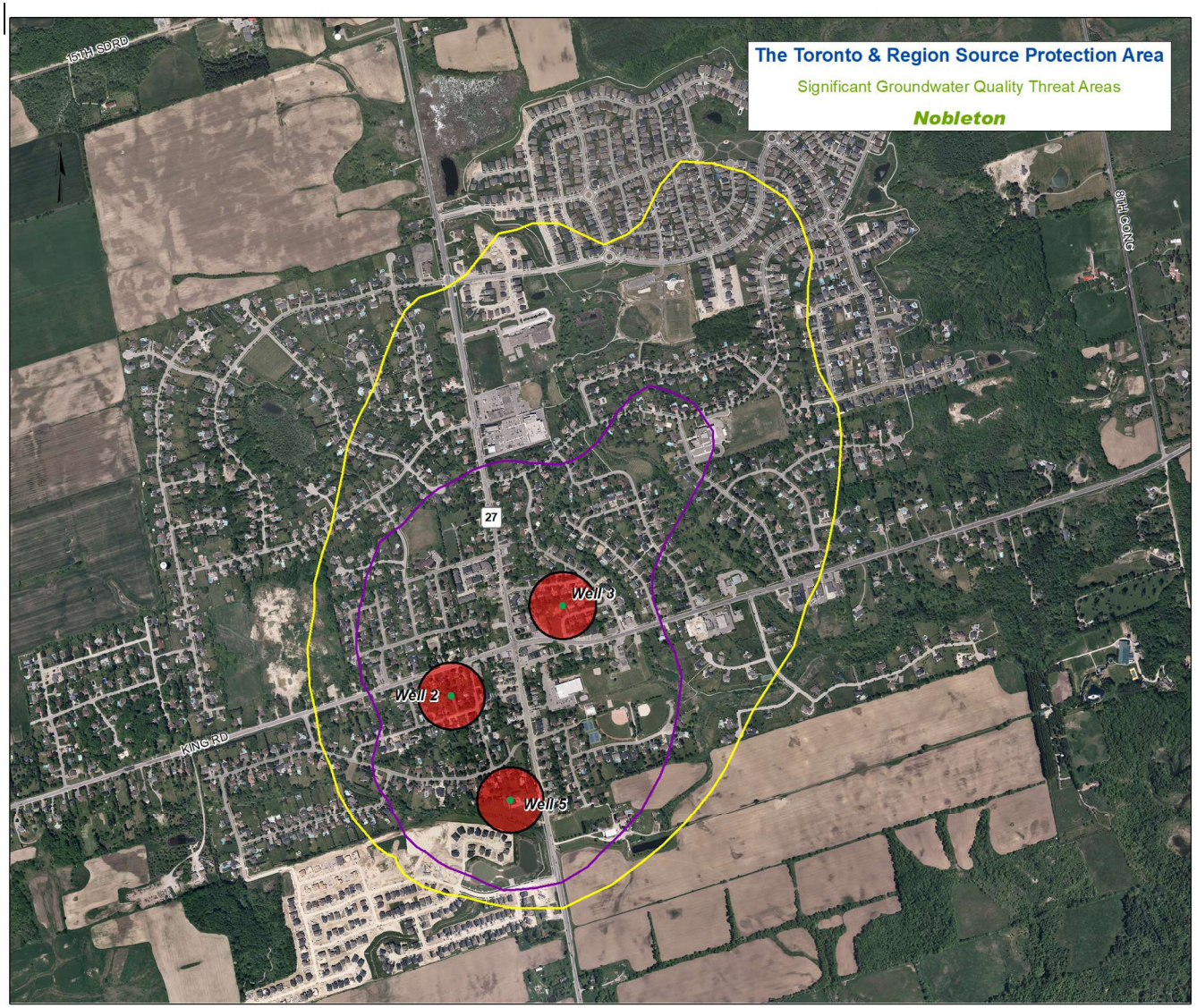



**Map 1.12: Palgrave – Significant Groundwater Quality Threat Areas**






**Map 2.12: Palgrave – Significant DNAPL Threat Areas**




**Legend**

WHPA - C
WHPA - B
WHPA - A
Wellhead

WHPA areas with Vulnerability Score = 10

Source Protection Area (SPA) Boundary

250 125 0 250 500
Metres

Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)



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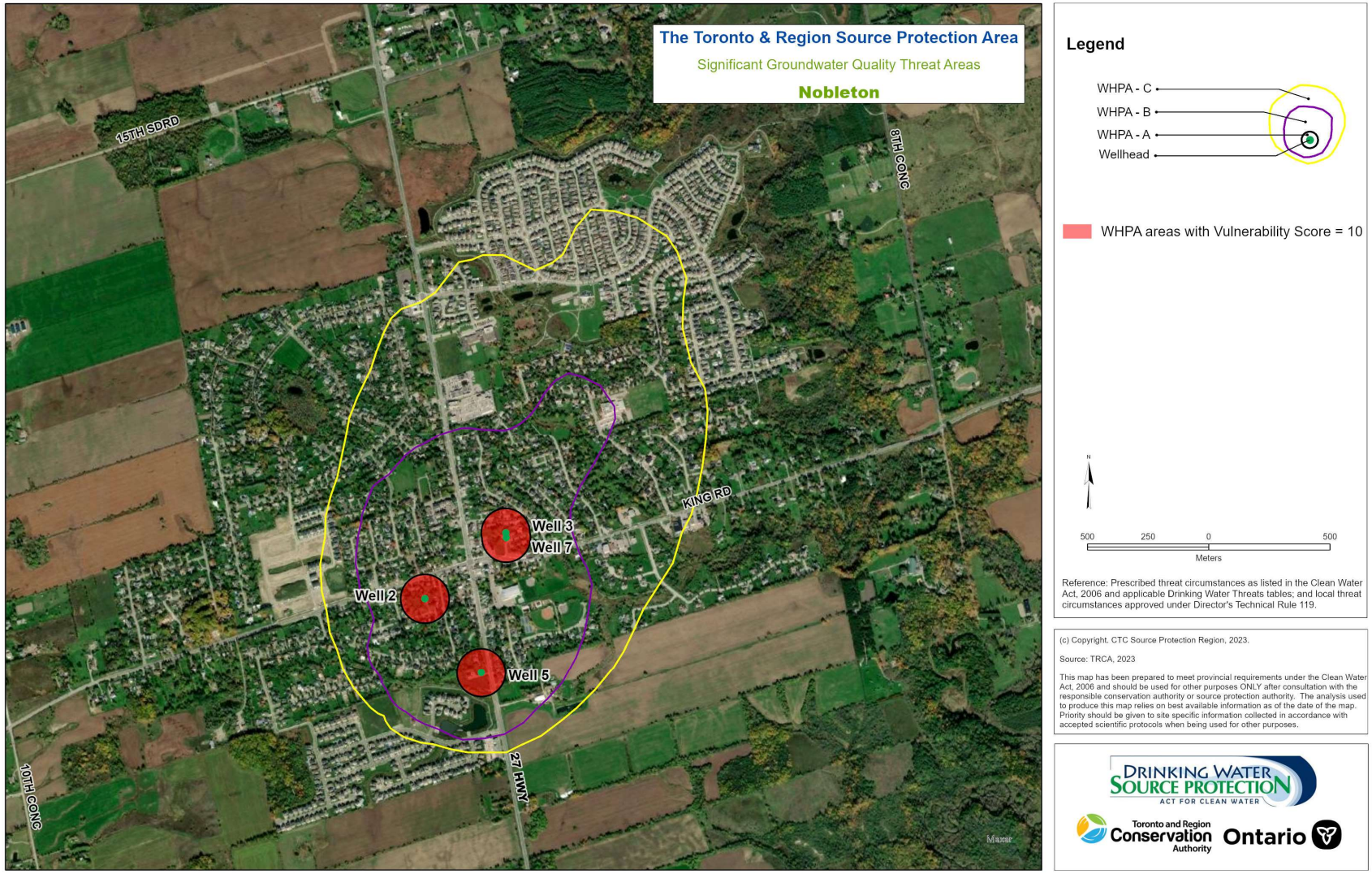
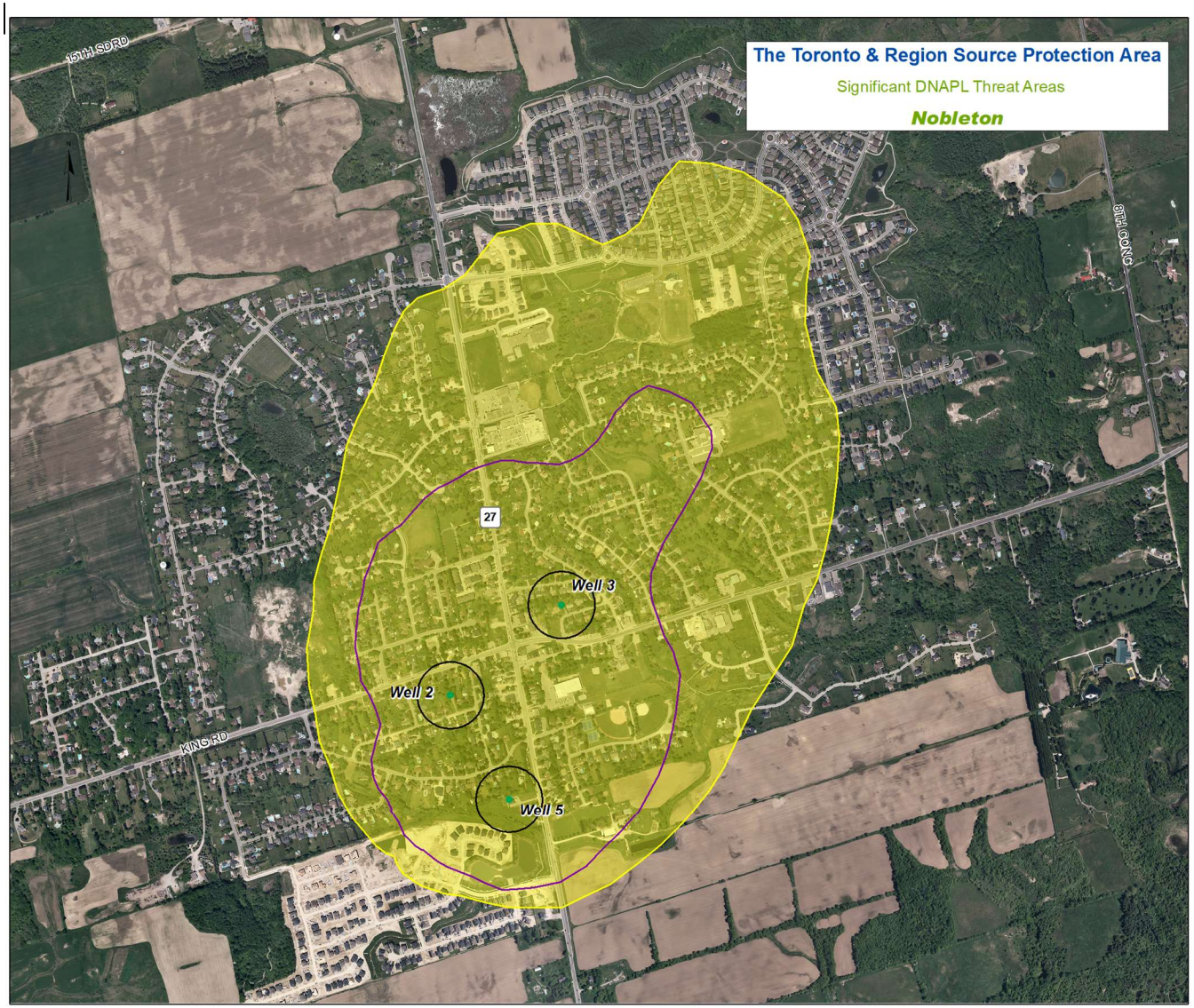



**Map 1.17: Nobleton – Significant Groundwater Quality Threat Areas**




**Legend**

WHPA - C
WHPA - B
WHPA - A
Wellhead

Dense Non-Aqueous Phase Liquids

Source Protection Area (SPA) Boundary

250 125 0 250 500
Metres

Reference: Prescribed threat circumstances as listed in the Ministry of the Environment Table of Drinking Water Threats (2009)



Source: TRCA, 2018; First Base Solutions, 2017.

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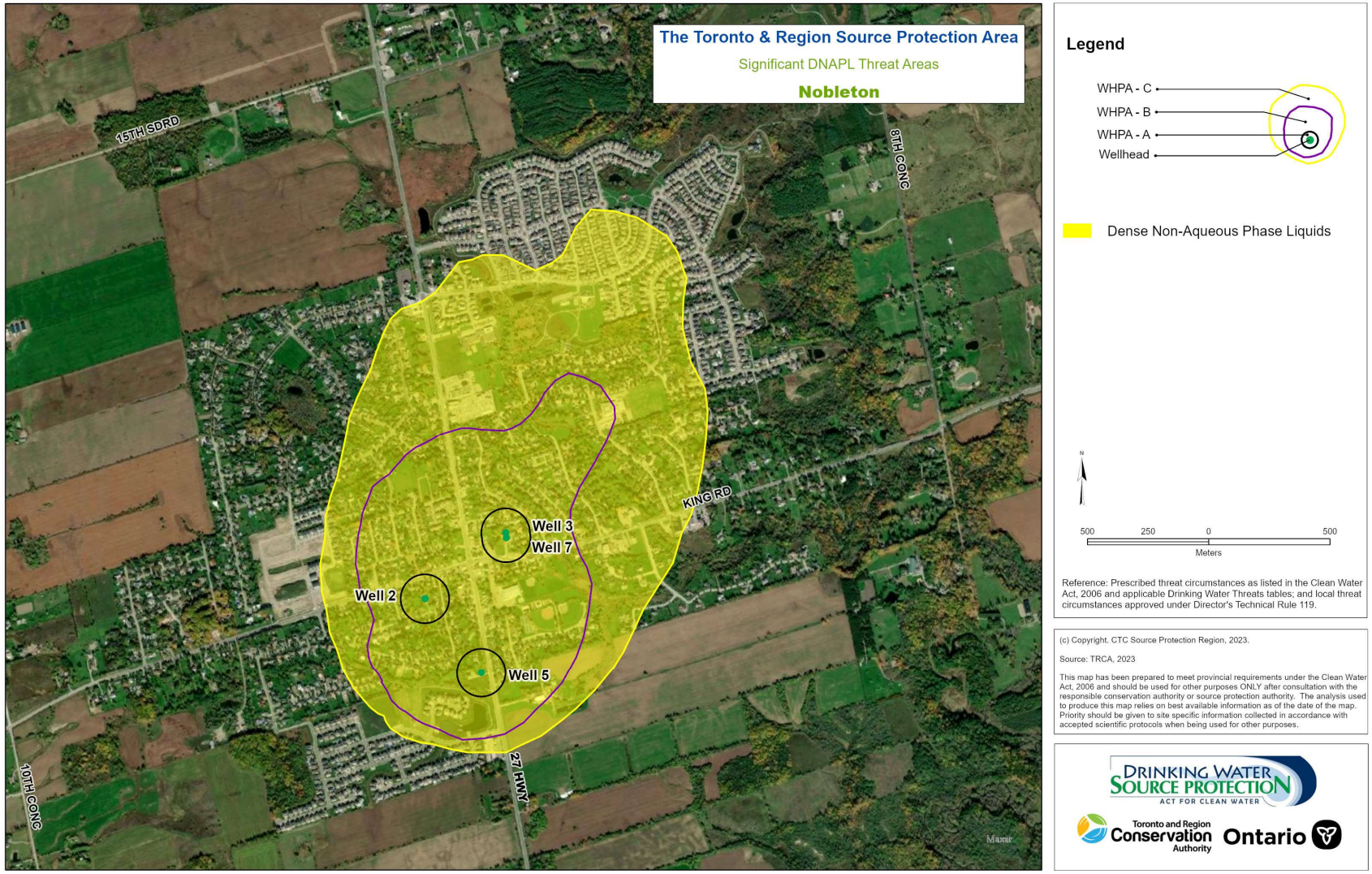
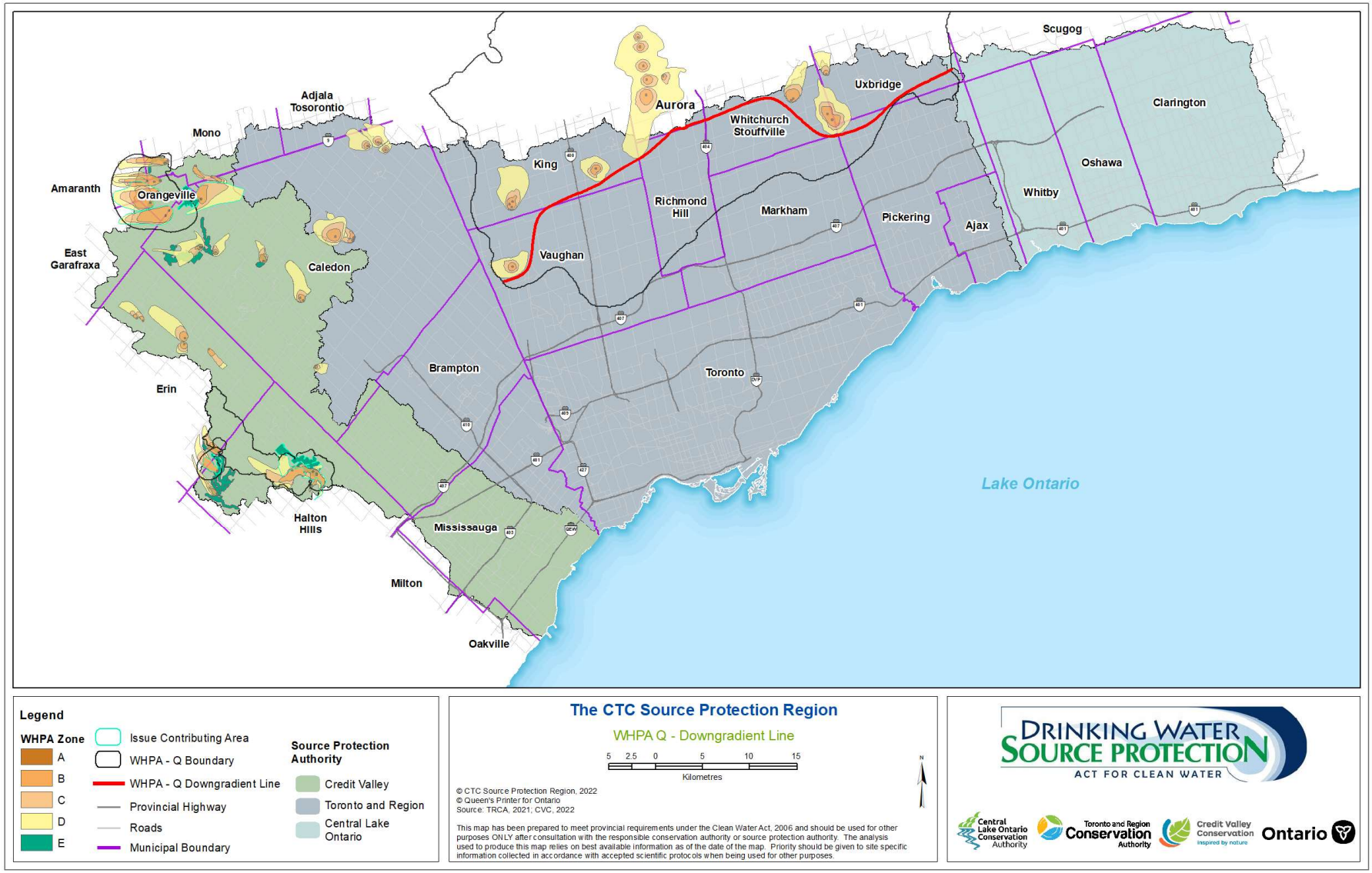
Ontario




**Map 2.17: Nobleton – Significant DNAPL Threat Areas**


Scugog
Uxbridge
Clarington
Aurora
Whitchurch
Stouffville
Adjala
Tosorontio
Mono
King
Oshawa
Whitby
Amaranth
Orangeville
Richmond
Hill
Markham
Pickering
Ajax
East
Garafraxa
Caledon
Vaughan
Brampton
Toronto
Erin
Lake Ontario
Halton
Hills
Mississauga
Milton
Oakville
Legend
WHPA Zone
A
B
C
D
E
Issue Contributing Area
WHPA - Q Boundary
WHPA - Q Downgradient Line
Provincial Highway
Roads
Municipal Boundary
Source Protection
Authority
Credit Valley
Toronto and Region
Central Lake
Ontario
The CTC Source Protection Region
WHPA Q - Downgradient Line
5 2.5 0 5 10 15
Kilometres
N
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Source: TRCA, 2021; CVC, 2022
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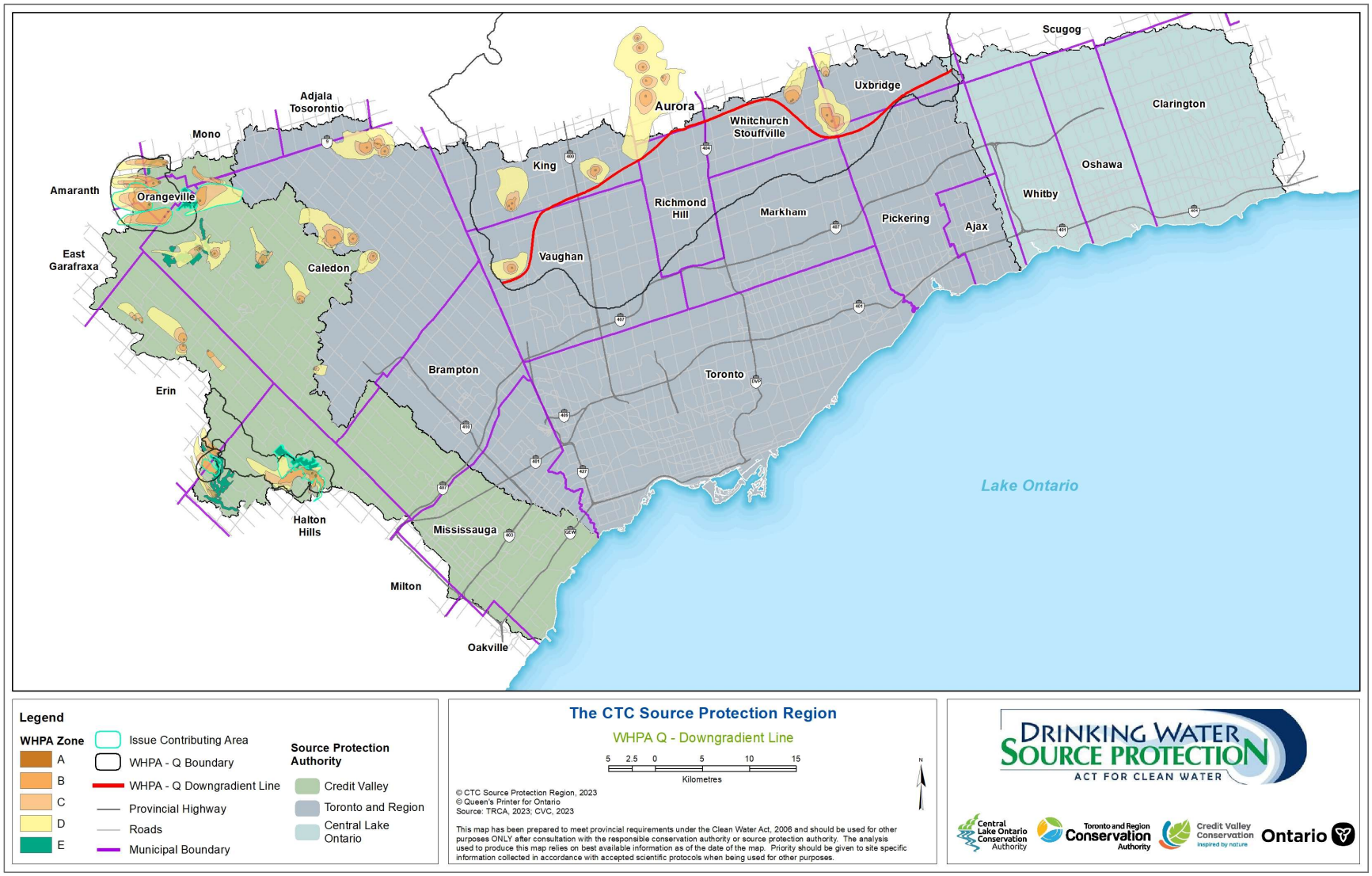
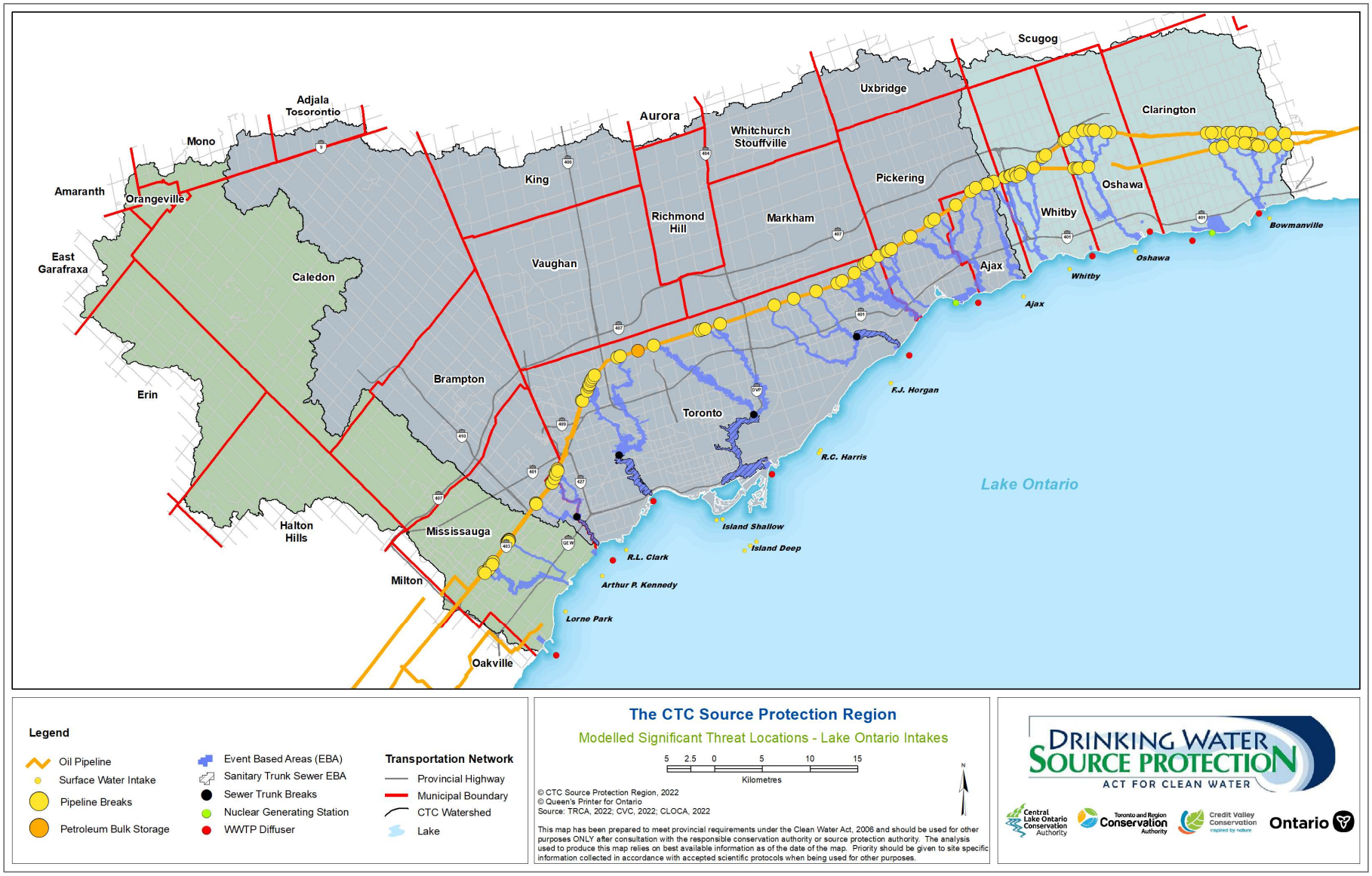
DRINKING WATER
SOURCE PROTECTION
ACT FOR CLEAN WATER
Central Lake Ontario Conservation Authority
Toronto and Region Conservation Authority
Credit Valley Conservation
Inspired by nature
Ontario




**Map 3.5: Downgradient Line – Toronto and Region Source Protection Area**


Scugog
Uxbridge
Clarington
Adjala
Tosorontio
Aurora
Whitchurch
Stouffville
Mono
Pickering
Oshawa
Amaranth
Orangeville
King
Richmond
Hill
Markham
Whitby
Bowmanville
East
Garafraxa
Caledon
Vaughan
Ajax
Oshawa
Whitby
Ajax
Brampton
Erin
F.J. Horgan
Toronto
R.C. Harris
Lake Ontario
Halton
Hills
Mississauga
Island Shallow
Island Deep
R.L. Clark
Milton
Arthur P. Kennedy
Lorne Park
Oakville
Legend
Oil Pipeline
Surface Water Intake
Pipeline Breaks
Petroleum Bulk Storage
Event Based Areas (EBA)
Sanitary Trunk Sewer EBA
Sewer Trunk Breaks
Nuclear Generating Station
WWTP Diffuser
Transportation Network
Provincial Highway
Municipal Boundary
CTC Watershed
Lake
The CTC Source Protection Region
Modelled Significant Threat Locations - Lake Ontario Intakes
5 2.5 0 5 10 15
Kilometres
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Source: TRCA, 2022; CVC, 2022; CLOCA, 2022
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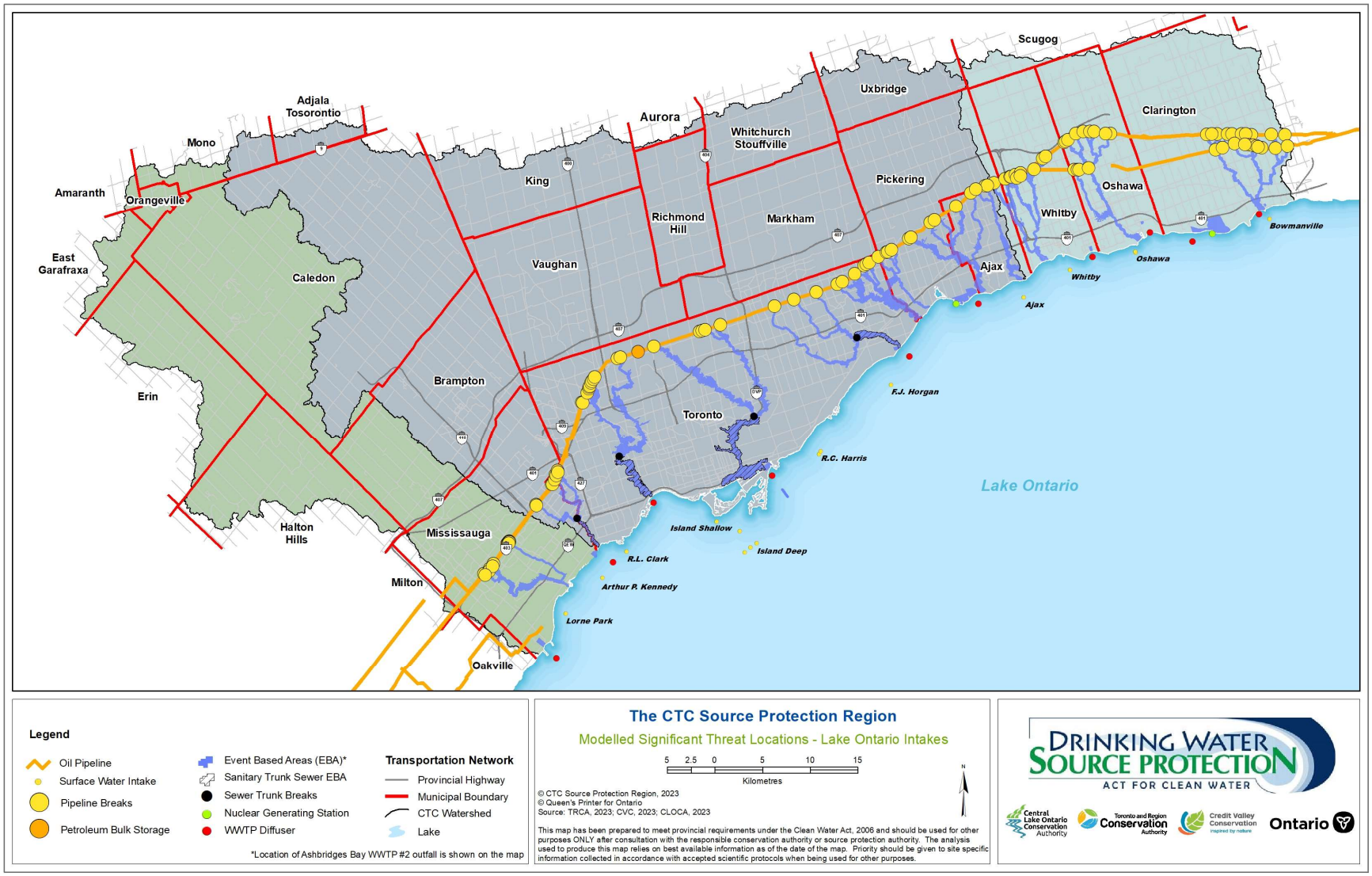
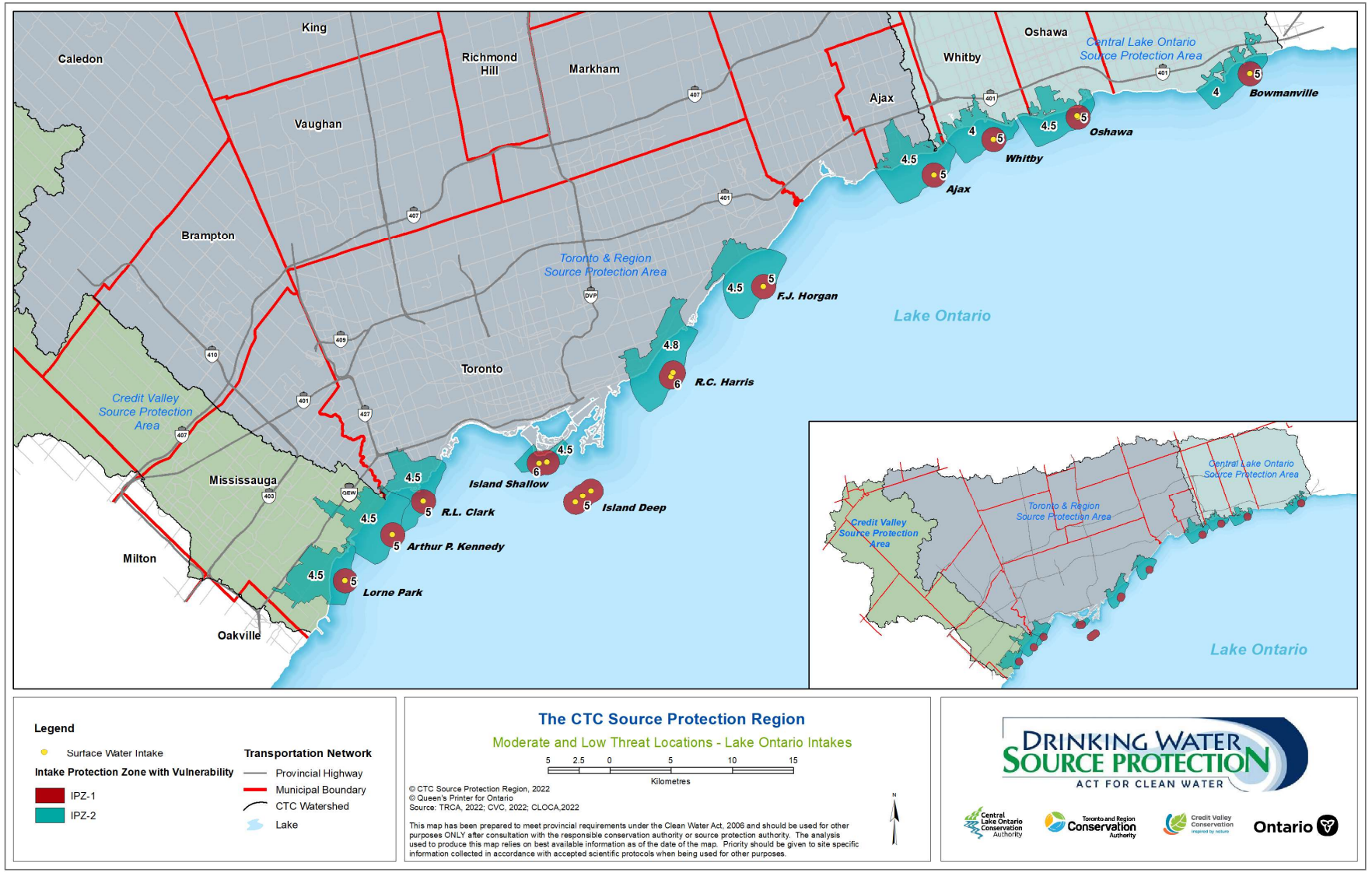
DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER
Central Lake Ontario Conservation Authority
Toronto and Region Conservation Authority
Credit Valley Conservation
Ontario




**Map 4.1: Lake Ontario Intakes – Modelled Significant Threat Locations**


King
Caledon
Richmond Hill
Markham
Vaughan
Oshawa
Whitby
Ajax
Central Lake Ontario Source Protection Area
Bowmanville
Oshawa
Whitby
Ajax
Brampton
Toronto & Region Source Protection Area
F.J. Horgan
Lake Ontario
Toronto
R.C. Harris
Credit Valley Source Protection Area
Mississauga
Island Shallow
Island Deep
R.L. Clark
Arthur P. Kennedy
Milton
Lorne Park
Oakville
Legend
Surface Water Intake
Intake Protection Zone with Vulnerability
IPZ-1
IPZ-2
Transportation Network
Provincial Highway
Municipal Boundary
CTC Watershed
Lake
The CTC Source Protection Region
Moderate and Low Threat Locations - Lake Ontario Intakes
5 2.5 0 5 10 15
Kilometres
© CTC Source Protection Region, 2022
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Source: TRCA, 2022; CVC, 2022; CLOCA,2022
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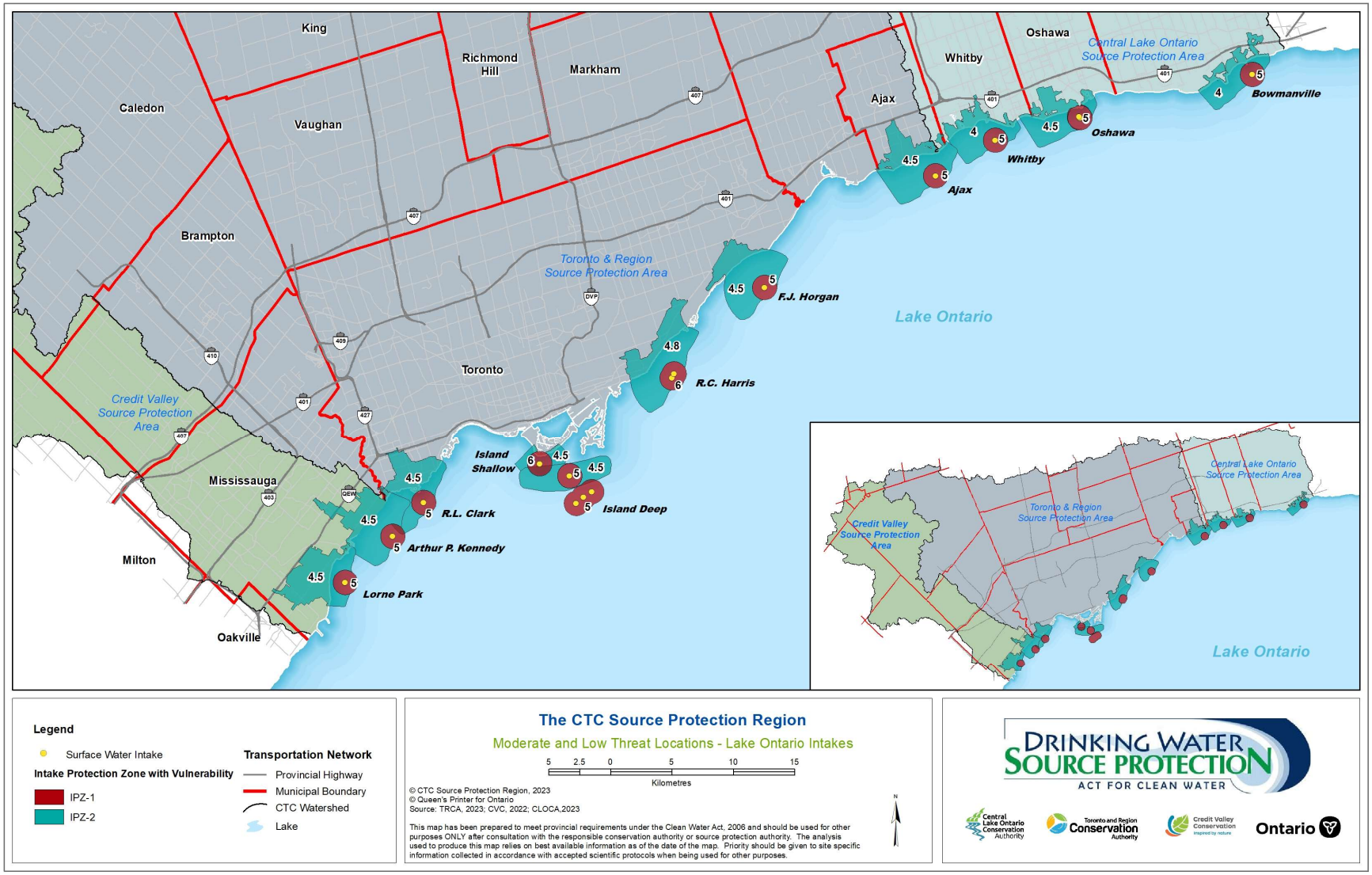
DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER
Central Lake Ontario Conservation Authority
Toronto and Region Conservation Authority
Credit Valley Conservation
Ontario




**Map 4.2: Lake Ontario Intakes – Moderate and Low Threat Locations**