CTC Source Protection Committee Meeting #4/22

Acting Chair: Dave Kentner

Wednesday December 7, 2022
1:00 – 4:00 p.m.

Hybrid meeting[1] (Microsoft TEAMS and in-person):
Credit Valley Conservation Administration Office, Boardroom
1255 Old Derry Road, Mississauga, ON

AGENDA

Page #

1. **Call to Order and Roll Call**

2. **Review of Agenda**

3. **Disclosure of Conflict of Interest**

4. **Minutes of Previous Meetings**

5. **Chair's Remarks**

6. **Updates**
   - 6.1 Update from the Ministry of Environment, Conservation and Parks Liaison Officer – Beth Forrest
   - 6.2 Update from Conservation Ontario Source Water Protection Lead – Debbie Balika
   - 6.3 Update on Bill 23 from Conservation Authority staff – Behnam Doulatyari

7. **Presentations**
   - 7.1 WHPA Updates and Groundwater Vulnerability Assessment for Caledon Village, Palgrave, and Caledon East. Patty Meyer, AquaInsight.
   - 7.2 New Toronto Island Enwave intake and Ashbridges Bay Treatment Plant outfall. Bill Snodgrass, City of Toronto & Don Ford, TRCA.
   - 7.3 New Nobleton emergency replacement well PW7. Scott Lister, Region of York.

8. **Committee Business**
   - 8.1 Reports to Committee
     - a. CTC Program Update **3**
     - b. Proposed Amendments Working Group Terms of Reference **6**
     - c. Credit Valley Source Protection Area Transport Pathway Assessment - Technical Report **12**
     - d. Region of Peel – Palgrave, Caledon East, and Caledon Village – New Modelling **74**

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

e. New Toronto Island Water Treatment Plant Intake and New Ashbridges Bay Treatment Plant Outfall **91**

f. New Well PW7 for York Region in Nobleton **101**

g. Proposed amendments to Toronto Region and Credit Valley Assessment Reports and CTC Source Protection Plan **108**

8.2 Other Business

9. **Next Meeting**
February 15, 2022 1:00 pm (hybrid: @ CVC head office & TEAMS)

10. **Adjourn**

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

TO: Chair and Members of the Source Protection Committee Meeting #4/22

DATE: December 7, 2022

FROM: Behnam Doulatyari, Senior Manager, Watershed Plans and Source Water Protection

RE: CTC Program Update

KEY ISSUE

A CTC Source Protection Region program update.

RECOMMENDATION

THAT the CTC Source Protection Committee receive the staff report CTC Program Update for information.

REPORT

Committee recruitment

There are two current public interest sector vacancies on the CTC Source Protection Committee, one allocated to environmental nongovernmental organizations, and the other to a citizen-at-large representative. A recruitment period seeking interested individuals recently closed on December 4th, 2022.

After review of applications materials by the Program Manager, interviews with selected candidates will be arranged. Candidates recommended by the interview panel, and supported by the CTC Management Committee, will be brought to a future Credit Valley Source Protection Authority meeting for their endorsement to join the CTC Source Protection Committee.

Working Group updates

The Amendments Working Group (AWG) met November 8, 2022, where an update was provided on the status of the Credit Valley Source Protection Authority transport pathways project (Committee Report 8.1c). The AWG also reviewed the proposed Terms of Reference for the working group (Committee Report 8.1b). The AWG considered the forthcoming s.34 amendments (Committee Reports 8.1d, 8.1e, 8.1f and 8.1g). Discussion was also held on possible FUEL policy revisions in consideration of the 2021 Director's Technical Rules changes, and Risk Management Plan deadlines.

The CTC Implementation Working Group (IWG) met on November 23, 2022, where members considered the revised Credit Valley Source Protection Authority transport pathways report (Committee Report 8.1c). An updated timeline for the upcoming s.34 (Committee Report 8.1g) was also discussed. The IWG also discussed upcoming Annual Reporting changes, and the possible impacts of Bill 23 on implementation of the Drinking Water Source Protection program.

Annual progress reporting

The CTC is required (as per *Clean Water Act, 2006* s.46) to submit an annual progress report on source protection plan implementation progress, by May 1st of each year, to the Ministry of the Environment, Conservation and Parks. The information that goes into these annual progress reports by implementing bodies (including municipalities) named in the CTC Source Protection Plan. To simplify information collection from municipalities and support analysis, CTC staff have been working to transition to the use of an Electronic Annual Reporting (EAR) online portal for the 2022 reporting year. This portal was originally developed by Upper Thames Region Conservation Authority staff and is used for annual progress reporting by all source protection authorities/regions to the province. It has been further adapted to allow the collection of annual reporting information from municipalities. This portal is already in use by several CTC municipalities, as part of their obligations to other Source Protection Regions. Future updates to the platform are expected to further streamline the reporting process.

Upcoming changes to municipal water systems

Under section 34 of the *Clean Water Act, 2006*, changes to drinking water systems need to be incorporated into approved assessment reports for the source protection plan policies to apply.

Updated timelines for anticipated amendments within the CTC region are presented in **Table 1**. Upcoming amendments relating to York's new Nobleton well; Peel Region's Palgrave, Caledon East, and Caledon Village systems; the City of Toronto new Enwave intake and Ashbridges Bay WWTP outfall are being bundled with policy updates and are discussed further in Committee Reports 8.1d, 8.1e, 8.1f, and 8.1g.

Table 1. Anticipated timeline of upcoming amendments under *the Clean Water Act, 2006*.

Drinking Water System	Pre-Consultation	Public Consultation	Submission Date
York Region (Nobleton replacement well PW7) (s. 34)	Spring 2023	June/July 2023	Fall 2023
Peel Region (Palgrave, Caledon East, Caledon Village) (s. 34)	Spring 2023	June/July 2023	Fall 2023
New Toronto Island intake (s. 34)	Spring 2023	June/July 2023	Fall 2023
Town of Erin (new Erin/Hillsburgh wells) (s. 34)	2023-2024	2023-2024	2024
Town of Orangeville new water supply (s. 34)	2023-2024	2023-2024	2024

Drinking Water System	Pre-Consultation	Public Consultation	Submission Date
York Region/Stouffville well 3 ICA	2023-2024	2024	2024
Durham Region GW model update (Uxville) (s. 36)	2023-2024	2024	2024-2025
Halton Region GW model (Georgetown/Acton) (s. 36)	2023-2024	2024	2024-2025
York Region (Nobleton new supply)	2025-2026	To be confirmed	To be confirmed
Peel Region (potential Inglewood new supply)	To be confirmed	To be confirmed	To be confirmed
Orangeville Tier 3 update	To be confirmed	To be confirmed	To be confirmed

Upcoming Meeting Schedule

CTC Source Protection Committee:

- February 15, 2023 1-4 p.m.
- March 23, 2023 1-4 p.m.
- In accordance with SPC direction provided at meeting #3/22, upcoming SPC meetings are being scheduled as "hybrid" meetings.

Report prepared by:

Craig Jacques, Specialist, Watershed Plans and Source Water Protection, Credit Valley Conservation

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Date: November 30, 2022

TO: Chair and Members of the Source Protection Committee Meeting #4/22

DATE: December 7, 2022

FROM: Behnam Doulatyari, Senior Manager, Watershed Plans and Source Water Protection

RE: Proposed Amendments Working Group Terms of Reference

KEY ISSUE

Establishment of a Terms of Reference to guide the work of the Amendments Working Group.

RECOMMENDATION

THAT the CTC Source Protection Committee receive the staff report Amendments Working Group Terms of Reference for information.

AND FURTHER THAT the CTC Source Protection Committee endorse the Amendments Working Group Terms of Reference

REPORT

Background

At meeting #1/16 of the CTC Source Protection Committee (SPC) held November 28, 2016, an Amendments Working Group (AWG) was formed so members of the SPC could work with source protection authority and municipal staff on recommendations for amendments to the source protection plan. Dave Kentner, was appointed Chair of the working group. The AWG met throughout 2017 and 2018 and developed the work plan for comprehensive review of the source protection plan under s. 36 of the *Clean Water Act, 2006*. The AWG was reconvened in 2021 to consider amendments resulting from changes to municipal drinking water systems and to provide input to policy reviews.

At meeting #1/22 (February 15, 2022), the SPC considered a staff report on the AWG, and provided feedback on its role going forward. The SPC directed that staff work with the SPC to confirm their representatives on the AWG, and further that staff establish a Terms of Reference (TOR) to guide the work of the AWG.

Proposed Terms of Reference development

Following discussion with the AWG Chair and SPC Chair on the composition of the AWG, staff reached out to all SPC members to confirm their interest in continuing or joining on the working group. On November 8, 2022, a draft Terms of Reference was considered by the AWG, who found the draft satisfactory.

The proposed TOR (see **Attachment 1**) identifies the membership and role of the

Chair, and notes that the AWG is a staff-level working group that reports to the CTC Program Manager. The AWG is expected to meet 2-6 times annually, until it is determined that the mandate has been completed.

The proposed mandate of the AWG includes: acting as a forum to consider Source Protection Plan implementation; and considering updates of the Source Protection Plan due to the changes in the Director's Technical Rules and as part of the comprehensive s.36 update. Key objectives of the working group are to: facilitate development of update Source Protection Plan to address gaps and implementation challenges; and consider solutions to outstanding concerns raised during consultation.

The AWG will review the TOR every three years, including the position and term of the AWG Chair. The need to continue the group will be considered annually. As pf er the TOR, proposed amendments to the Terms of Reference will be brought to the Source Protection Committee.

Summary and Next Steps

Pending endorsement of the AWG Terms of Reference by the SPC, in December, staff will send out a proposed 2023 schedule of AWG meeting dates. New members of the SPC will be gauged in their interest in joining the AWG.

Report prepared by:

Craig Jacques, Specialist, Watershed Plans and Source Water Protection, Credit Valley Conservation

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Date: Dec 07, 2022

Attachments: 1

ATTACHMENT 1: Amendments Group Terms of Reference

Credit Valley – Toronto and Region – Central Lake Ontario Source Protection Region

Amendments Working Group

Terms of Reference

December 07, 2022

Background

- The Credit Valley – Toronto and Region – Central Lake Ontario (CTC) Source Protection Committee (SPC) prepared the CTC Source Protection Plan and Assessment Reports for all three Source Protection Areas in the CTC Source Protection Region, based on the Ministry of the Environment, Conservation and Parks-approved Terms of Reference.
- The Source Protection Plan (SPP) and Assessment Reports (AR) are approved and have been in effect since December 31, 2015. Since that time, the SPP and ARs have been periodically updated.
- At meeting #1/16 of the CTC SPC held November 28, 2016, an Amendments Working Group (AWG) was formed so members of the SPC could work with conservation authority and municipal staff on recommendations for amendments to the source protection plan.
- From 2017-2018, the AWG supported amendments to the SPP and ARs, and developed a work plan for comprehensive review of the SPP under s. 36 of the *Clean Water Act, 2006*.

Mandate

The mandate of the Amendments Working Group is to:

- Act as a forum for information-sharing and discussion regarding the Source Protection Plan and its implementation
- Support comprehensive review and update of the SPP under s. 36 of the *Clean Water Act, 2006*
- Support updates to the SPP and ARs resulting from changes to the Director's Technical Rules and Tables of Drinking Water Threats
- Provide support for CTC Source Protection Region program staff in the completion of updates to the SPP and ARs

Membership updated: Nov. 29, 2022

Objectives

The objectives of the Amendments Working Group are to:

- Work in a collaborative and cooperative manner to help implementing bodies (e.g., municipalities) implement Source Protection Plan policies
- Engage in all topics relevant to plan implementation brought forward by participating members
- Facilitate the development and update of SPP policies to address drinking water quality and quantity threats and any gaps and / or implementation challenges
- Develop and discuss draft amendments and updates to the Source Protection Plan and Assessment Reports, as proposed under sections 34, 35, or 36 of the *Clean Water Act* or section 51 of Ontario Regulation 287/07
- Discuss solutions for outstanding concerns identified regarding the Source Protection Plan through comments received during public consultation
- Support CTC Source Protection Region staff in assessing and completing watershed- or Source Protection Region-wide work, e.g., changes to the Director's Technical Rules

Membership

The Amendments Working Group is a distinct group with representation from municipalities within the CTC Source Protection Region, the Source Protection Committee, and the Credit Valley, Toronto and Region, and Central Lake Ontario conservation authorities.

Per direction from the CTC SPC in 2016, the working group membership was to include 3-6 SPC members, with representation from municipal, economic, and public interest sectors. SPC membership in the working group has been broadened to reflect strong interest and a desire to engage a broader range of sectors through the comprehensive review under s. 36 of the Act. The list of working group members is included in Appendix A.

From time to time, representatives from other Source Protection Regions, provincial agencies, or external organizations (e.g., the Oak Ridges Moraine Groundwater Program) may participate in meetings of the AWG upon invitation.

Chair

The Amendments Working Group is chaired by a member of the Source Protection Committee. The purpose of the chair is to act as a liaison and communication link between the working group and the SPC. The chair position and term will be reviewed together with the AWG Terms of Reference every three years, or as needed to reflect changes to the CTC SPC membership.

The CTC Source Protection Chair is an ex-officio member of all Working Groups.

Reporting

The Amendments Working Group is a staff-level working group and reports to the CTC Source Protection Region Program Manager.

The Program Manager reports to the Source Protection Committee on a regular basis. SPC meetings may include reports with information developed and/or discussed by the Amendments Working Group.

Information presented to the SPC may include solutions reached on SPP revisions or amendments, new technical and policy components as a result of new technical work, and any other discussions on SPP implementation.

The Program Manager will update the Credit Valley Source Protection Authority, as the lead source protection authority in the CTC Source Protection Region, on a regular basis on progress made in SPP amendments and plan implementation.

Working Group Meetings

- The Amendments Working Group will meet on a regular basis until it is determined that the mandate has been completed. The need to continue the group will be evaluated on an annual basis.
- Frequency of meetings –2-6 meetings annually, or at the call of the Program Manager. Depending on the agenda, meetings may be cancelled or postponed.
- Meetings will be up to 3 hours in duration and held during business hours (Monday-Friday, 9 am – 4:30 pm)
- Location and format of meetings – virtual meetings preferred with some face-to-face meetings at the CVC Head Office, 1255 Old Derry Road Mississauga, when appropriate.
- Agenda packages will be circulated to working group members a minimum of three (3) business days prior to a meeting, i.e. Friday, prior to the next Wednesday meeting
- Meeting notes will be written up and circulated to working group members with the agenda package of the next meeting

Conflict Resolution

- Decisions will be made by consensus among the members present
- If no decision can be made by consensus, the minority opinions will be documented

Review of Terms of Reference

The Amendments Working Group should review the Terms of Reference every three years. The AWG should seek support from the Source Protection Committee for any amendments to the Terms of Reference.

Appendix A: CTC Amendments Working Group Membership

Member	Affiliation
CTC Source Protection Committee	
David Kentner, Chair, Amendments Working Group (appointed 2016)	Municipal sector – Wellington, Halton
Scott Lister	Municipal sector – York Region (and Risk Management Official, York Region)
Chris Gerrits	Municipal sector – Dufferin, Simcoe
Julie Abouchar	Public interest
Peter Miasek	Public interest
Ken Dion	Public interest
Vacant	Public interest
Ryan Wheeler	Economic sector
Geoff Maltby	Economic sector
Vacant, SPC Chair	ex officio member of Amendments Working Group
Municipal	
Maureen Bianchet	Region of Durham
Tavis Nimmo	Region of Durham
Colin Hall	Region of Durham
Joanna Miron	York Region
Bill Snodgrass	City of Toronto
Therese Estephan	Region of Peel
Stefan Herceg	Region of Peel
Daniel Banks	Halton Region
Jon Clark	Halton Region
Hayley Pankhurst	Halton Region
Kyle Davis	County of Wellington municipalities
Emily Vandermeulen	County of Wellington municipalities
Ryan Post	Town of Mono
Dwight Smikle	Township of East Garafraxa, Township of Amaranth
Stephanie Charity	Township of East Garafraxa, Township of Amaranth
Brandon Ward	Town of Orangeville
Rebecca Smart	Town of Orangeville
Tiffany Svensson	Blumetric (on behalf of Town of Orangeville)
Muriel Kim-Brisson	Blumetric (on behalf of Town of Orangeville)
Conservation Authority	
Behnam Doulatyari, CTC Program Manager	Credit Valley Conservation
Craig Jacques, CTC Program Coordinator	Credit Valley Conservation
Kerry Mulchansingh	Credit Valley Conservation
Hailey Ashworth	Credit Valley Conservation
Annie Li	Credit Valley Conservation
Parastoo Hosseini	Credit Valley Conservation
Daniela MacLeod	Toronto and Region Conservation Authority
Don Ford	Toronto and Region Conservation Authority
Kristina Anderson	Toronto and Region Conservation Authority
Jeff Thompson	Toronto and Region Conservation Authority
Rod Wilmot	Central Lake Ontario Conservation Authority
Chris Jones	Central Lake Ontario Conservation Authority
Fred Carpio	Central Lake Ontario Conservation Authority

Membership updated: Nov. 29, 2022

TO: Chair and Members of the Source Protection Committee Meeting #4/22

DATE: October 5, 2022

FROM: Behnam Doulatyari, Senior Manager, Watershed Plans and Source Protection, Credit Valley Conservation

RE: Credit Valley Source Protection Area Transport Pathway Assessment - Technical Report

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KEY ISSUE

Endorsement of a consistent method for municipal assessment of transport pathways affecting the vulnerability of wellhead protection areas.

RECOMMENDATION

THAT the CTC Source Protection Committee receive the staff report Endorsement of Credit Valley Source Protection Area Transport Pathway Assessment - Technical Report for information.

AND FURTHER THAT staff be directed to provide the Technical Report to municipalities undertaking updates to wellhead protection areas to guide their assessment of transport pathways.

REPORT

Background

A transport pathway is a human-made or natural feature at or below the ground surface that can promote quicker travel of contaminants to drinking water wells or surface water intakes. Examples of transport pathways include:

- abandoned or improperly maintained wells
- pits and quarries that breach the protective soil and rock layers
- underground infrastructure such as storm sewers and sanitary sewers
- pipelines
- road ditches and other drainage systems

The provincial Director's Technical Rules (DTRs, 2021) do not prescribe a method for identifying transport pathways but do provide a framework which does allow for the vulnerability of a wellhead protection area (WHPA) or intake protection zone to be increased because of the presence of a human-made transport pathway. Areas of low vulnerability can be adjusted to medium or high vulnerability, and areas of medium vulnerability can be adjusted to high vulnerability. The DTRs list the following factors

to consider in determining whether and to what extent to adjust vulnerability:

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

Preliminary transport pathways work in the CTC Source Protection Region (SPR) was undertaken by various consultants. The assumptions, data sources, and methods employed by consultants varied significantly across the region. To improve consistency and standardization, a transport pathway adjustment study was undertaken by the Central Lake Ontario Source Protection Authority for the CTC SPR and is documented in Appendix D to the Central Lake Ontario Source Protection Area assessment report (approved July 2015). The study noted data gaps, including lack of consistency of data on wells / boreholes among municipalities, and little to no information relating to linear infrastructure and geothermal installations.

When the CTC assessment reports were approved in 2015, only pits and quarries were included as transport pathways, and it was recognized that additional work needed to be done to identify and include other types of pathways. The work plan for update of the CTC Source Protection Plan under section 36 of the *Clean Water Act, 2006*, recommended updating transport pathways inventories and considering new policies for notifications when a new pathway is created.

<u>Credit Valley Source Protection Area Transport Pathway Assessment - Technical Report</u>

In 2019, Credit Valley Source Protection Authority (CVSPA) began a pilot study. The objectives of the study were to:

1. Review past CTC transport pathways work and recent (post-2017) transport pathway assessments for other source protection regions, with a focus on neighboring Lake Erie, Halton-Hamilton and Niagara Peninsula regions
2. Develop a defensible and repeatable methodology for transport pathway assessments for WHPAs within the CTC SPR
3. Apply the methodology in the CVSPA
4. Share the results of the pilot study (transport pathways and associated potential changes to WHPA vulnerability scoring) with municipalities and the CTC Source Protection Committee.

The report underwent several reviews by municipal and conservation authority staff between 2020 and 2021. The Amendments Working Group received a presentation on the pilot study on June 28, 2021, and preliminary study results were presented to the Implementation Working Group on July 14, 2021. A draft report, containing results, mapping of transport pathways and recommendations for adjusted vulnerabilities, was circulated for review by the Implementation Working Group in February 2022. In April and May, final meetings were held with Risk Management Officials (RMOs) for municipalities within the Credit River watershed to discuss the

pilot application of the method and review the results that were generated. The report was presented to the CTC Source Protection Committee during the Oct 5th meeting. Staff were instructed to improve clarity and language surrounding the methodology and its implications for municipality and request further feedback from the Implementation Working Group. The updated draft was approved by the Implementation Working Group on Nov 23rd and decision was made to bring the final report to CTC Source Protection Committee for final approval.

The report (Attachment 1) describes a method for a desktop assessment of transport pathways related to the following features:

- Pits and quarries
- Landfills
- Stormwater management ponds
- Sanity and storm sewers
- Water mains
- Sewage lagoons
- Geothermal systems

The pilot application of the method in the Credit River WHPAs drew on data from the Oak Ridges Moraine Groundwater Program database, which includes provincial Water Well Information System records and other data, as well as provincial mapping of pits and quarries, Enbridge pipeline mapping, and municipal infrastructure mapping.

Since the initial assessment, the quality of the water well/borehole data has improved substantively thanks mostly to quality control work by the Oak Ridges Moraine Groundwater Program. Municipal linear infrastructure mapping has also improved and generally more comprehensive, although information on the depth of infrastructure remains a key gap. Efforts were made to secure mapping of geothermal systems, but ultimately the data was not of sufficient quality to support analysis.

It is recommended that the vulnerability rating in the buffer area around identified pathways be increased by one category (i.e., low to medium or medium to high) as a result of the presence of transport pathways. This in turn may result in an increase in vulnerability score. The results and recommendations of the study are summarized in the Tables 1 through 4 and detailed in the appended report.

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)[1]
Georgetown	medium	4	660.9	19.09	4 to 6	high	3.0
Hillsburgh	medium	8	18.9	6.38	8 to 10	high	34.0
Alton	low	2 & 6 (B)	568.8	10.36	2 to 4; 6 to 8	medium	2.0
	medium	4, 6 & 8	33.2	5.78	4 to 6; 6 to 8 8 to 10	high	17.0
Orangeville	low	6 (B)	254.8	6.34	6 to 8	medium	2.0
	medium	8	224.8	1.33	8 to 10	high	1.0

Table 1: Wells and Boreholes identified as Transport Pathways

[1] For example, 3.0% of the Georgetown WHPA is recommended to be adjusted from a vulnerability score 4 to 6.

Table 2: Active Pits and Quarries identified as Transport Pathways

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)
Alton	Low	2	502.5	29.4	2 to 4	medium	6.0
Hillsburgh	Low	2	150.5	54.6	2 to 4	medium	36.0
Georgetown	Medium	4	660.9	17.2	4 to 6	high	3.0
Mono	Medium	4 (D), 6 (C) & 8	102.4	5.3	4 to 6; 6 to 8; 8 to 10	high	5.0
Amaranth	Low	2,4,6	580.44	30.7	2 to 4; 4 to 6 6 to 8	med	5.3
Orangeville	Well 10 - Low	2	16.9	15.7	2 to 4	medium	93.0
	Well 6 - Low	2, 4 & 6	516.6	50.0	2 to 4; 4 to 6; 6 to 8	medium	10.0
	Well 7 - Low	2 & 4	415.9	34.8	2 to 4; 4 to 6;	medium	15.0
	Well 10 - Medium	4	24.4	12.7	4 to 6	high	53.0
Caledon Village	Low	2, 6	70.8	34.8	2 to 4; 4 to 6; 6 to 8	medium	50.0
	Medium	6 (C) & 8	34.9	3.4	6 to 8; 8 to 10	high	10.0

Table 3: SWM Ponds identified as Transport Pathways

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)
Orangeville (Well 2a, 5, 6, 7 & 9 A, B, 10 &11)	medium	8	578.3	9.1	8 to 10	high	2.0
Mono - Island Lake	Medium	6 (C) & 8	56.9	4.5	6 to 8; 8 to 10	high	8.0
	Low	4 & 6 (B)	43.2	0.8	4 to 6; 6 to 8	medium	2.0

Table 4: Linear Features identified as Transport Pathways

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)
Orangeville Wells 2A,5,5A, 7, 9A & B	Low	6	363.3	3.3	6 to 8	medium	1.0
	Medium	8	126.8	0.5	8 to 10	high	0.40
Caledon Village	Low	2 & 6 (B)	31.7	0.8	4 to 6; 6 to 8	medium	3.0
	Medium	8	7.5	0.2	8 to 10	high	3.0

The methodology and criteria applied in this pilot are identical /comparable to those applied in surrounding jurisdictions and the framework under development by Conservation Ontario. The methods described in the report were implemented by Peel Region through technical studies recently completed as part of the Section 34 update for Caledon Village, Caledon Easy and Palgrave water systems.

Updating Transport Pathways in the Assessment Reports

In consultation with municipalities, it was determined that the results of the pilot application of the transport pathways method in the Credit River WHPAs will not be used to amend vulnerability scoring of the WHPAs in the Credit River Assessment Report. Wellhead protection area mapping and vulnerability assessments for almost all municipal drinking water systems in the Credit Watershed will be updated in the coming 1-5 years as municipalities pursue new wells and/or update groundwater models. As a result, municipalities will include updated transport pathways analyses within their scope of technical work. Pending Source Protection Committee endorsement, the technical report will be provided to municipalities to guide this work.

Next Steps

CTC staff will continue to support municipal update of transport pathways analyses and incorporate updated vulnerability assessments in the Credit Valley and Toronto and Region assessment reports as they become available. The next phase of CTC transport pathways work will inform the discussion on creating policies to address transport pathway in line with the section 36 work plan task 9.

Report prepared by:

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Date: December 7, 2022

Attachments: 1

ATTACHMENT 1: Review of Transport Pathways in the Credit Valley Source Protection Area

Credit Valley Source Protection Area Transport Pathway Assessment

Technical Report

November 23, 2022

DRINKING WATER SOURCE PROTECTION
Our Actions Matter

CTC Source Protection Region

Contents

1. Background 3
2. Data Sources 4
2.1 Gaps and Limitations 6
3. Study Approach 7
3.1. Transport Pathways Inventory 7
3.1.1 Vertical Features 8
3.1.2 Linear Features 12
3.1.3 Excluded Features 13
3.2 Groundwater Vulnerability Assessment 14
4. Findings 17
4.1 Vertical Transport Pathways 21
4.2 Linear Transport Pathways 26
5. Bibliography 28
Appendix A: Data Sources 30
Appendix B: Transport Pathways GIS Methods 32
Appendix C: Figures 36

1. Background

A transport pathway is an anthropogenic (human-introduced) feature at or below the ground surface that increases the vulnerability of drinking water supply sources. Such transport pathways circumvent the natural protection provided by overlying soil and rock confining layers, resulting in a greater risk of contamination of the aquifer complexes that provide municipal drinking water supplies. Transport pathways can be created through abandoned or improperly maintained wells, pits, and quarries that breach the confining layer, underground infrastructures such as storm sewers and sanitary sewers, pipelines, road ditches, and other drainage systems.

The Clean Water Act O. Reg. 287/07, requires municipalities to notify the source protection authority and source protection committee about proposals that may result in new or modified transport pathways, as they may affect the vulnerability of the drinking water source to contamination. The Director's Technical Rules 39 through 41 allow for an increase in vulnerability scoring for a municipal aquifer due to the presence of transport pathways upon consideration of:

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

These changes may result in the identification of additional threat activities that require management through source protection plan policies.

Preliminary transport pathways work in the Central Lake Ontario, Toronto, and Region, and Credit Valley (CTC) Source Protection Region (SPR) was undertaken by various consultants based on the Director's Technical Rules (v. 2009). The assumptions, data sources, and methods employed by consultants varied across the SPR. To improve consistency and standardization, a transport pathway adjustment study was undertaken by the Central Lake Ontario Source Protection Authority for the CTC SPR and is documented in Appendix D to the Central Lake Ontario Source Protection Area assessment report (approved July 2015).

While subsurface utilities, aggregate operations, and water wells were all considered in the transport pathways analysis for wellhead protection areas (WHPAs) in the Credit Valley Source Protection Area (CVSPA), only transport pathways resulting from aggregate pits and quarries resulted in adjustments to WHPA vulnerability scoring.

Uncertainties associated with the water well database and the unknown depth of municipal linear infrastructure limited the analysis. It was recognized at the time that updates may be considered in future amendments to the assessment reports with improvements in data quality and availability.

Over the last decade, the coverage and accuracy of the water well and borehole database have been improved significantly, primarily through work completed by Oak Ridges Moraine Groundwater Program and its partner agencies. This has allowed for refinement in the location and depth of wells and boreholes. Furthermore, section 36 workplan for CTC SPR includes a task to consider the creation of policies to address transport pathways. Given the extent of improvements in relevant databases update of the transport pathway assessment for CTC SPR is timely.

While the Director's Technical Rules provide a general framework for the assessment of transport pathways, they are not prescriptive on the methodology to be applied in the analyses. This technical study provides a guideline for the assessment of transport pathways in Well Head Protection Areas (WHPAs) of the Credit Valley – Toronto and Region – Central Lake Ontario (CTC) Source Protection Region (SPR). It was developed by staff and successfully applied to Credit Valley Source Protection Area. As noted by the Ministry of Environment, Conservation, and Parks, professional judgment should be exercised particularly where site-specific information may be available. In general, because of the inherent uncertainty in data utilized for such assessment, a precautionary approach is recommended. The Transport Pathways Guidance under development by Conservation Ontario will provide the technical framework for such studies in the future.

The next phase of this project will focus policy implication from the presented results on the CTC Source Protection Plan as outlined in task 9 of the CTC Section 36 work plan. It will be provided under a separate study (Credit Valley Source Protection Area Transport Pathway Assessment Policy Analysis) anticipated in 2023.

2. Data Sources

Key sources of data are described below and summarized in Table 1. A more detailed summary of data sources is included in Appendix A.

- **Oak Ridges Moraine Groundwater Program (ORMGP) database:** This dataset contains information on water wells, geotechnical boreholes, oil and gas, and geotechnical boreholes within the landscape covered by WHPAs. In addition, the dataset helps with the identification of the aquifer layer

associated with municipal well intakes. The most recent borehole datasets were made available in January 2021.

- **Ministry of Natural Resources and Forestry (MNRF):** data on pits and quarries was acquired to determine whether these features have the potential to create transport pathways.

- **Municipalities:** Source data was provided by municipalities in the form of GIS files, with attributes detailing the location of existing facilities and subsurface structures (see Appendix A).

- **Oil Pipelines:** Data on the location of oil pipelines was provided by the Enbridge Corporation for previous work on events-based modeling (IPZ-3 delineation).

Table 1. Summary of data sources

Feature	Orangeville	Peel	Halton Region	Mono	Wellington
Pits and Quarries	Downloaded from Ontario GeoHub	Downloaded from Ontario GeoHub	Downloaded from Ontario GeoHub	Downloaded from Ontario GeoHub	Downloaded from Ontario GeoHub
Landfill	×	✓	✓	No Active landfills	✓
Stormwater Management Pond	✓	✓	✓	✓	Not available in a GIS format
Sanity Sewer	✓	✓	✓	✓	No sanitary sewage system in Erin
Storm Sewer	✓	✓	✓	✓	Not available in a GIS format
Water main	✓	✓	✓	✓	Not available in a GIS format
Sewage Lagoon	×	×	×	×	No Sewage lagoon in Erin

Geothermal Systems	×	×	×	×	None in Erin

X: no data available; ✓: data provided

2.1 Gaps and Limitations

The analysis was performed entirely as a desktop study. The best available data from internal sources as well as municipal and provincial partners were used in the identification of transport pathways. The analyses were limited by the following factors:

- The condition of the data and information sourced (accuracy, attributes, currency) were varied, depending on the location and source of the data.
- Development plans, well logs, and other engineering drawings were not readily available in digital format for all water systems. This limiting factor has remained largely unchanged since previous studies, though some improved datasets have become available mainly for the larger municipalities.
- Depth information pertaining to linear infrastructure and deep excavations (other than pits and quarries) remains unavailable for most areas, therefore informed assumptions were made for this attribute.
- Information on the location and depth of geothermal systems could not be accessed. An Environmental Compliance Approval (ECA) is required for geothermal systems under Ontario Regulation 98/12. However, despite an exhaustive search through member municipalities (lower and upper tier), ORMGP, and Geohub (MECP), no data or potential sources could be identified.

It is recognized that future refinements to the analysis will be made as additional data and resources become available, analytical methods evolve, and new potential transport pathways are identified. It should also be noted that many of the municipalities within the CVSPA are in the process of updating WHPA mapping and vulnerability assessments for one or more of their water systems either currently underway or anticipated in the next few years. As a result, the shape and size of existing WHPAs may change and transport pathways will need to be re-assessed prior to any amendment of the Credit Valley Source Protection Area Assessment Report (CVSPA AR).

3. Study Approach

The review of transport pathways was completed through the following steps:

1. Transport Pathways Inventory – create a list of anthropogenic features within municipal WHPAs including both vertical and horizontal features.

    a. Collect data from appropriate sources such as municipalities, the province (Ontario Geohub), ORMGP, and private companies (e.g., Enbridge).

    b. Conduct a QA/QC exercise to assess the reliability of the data sets.

2. GIS Analysis - identify transport pathways through a desktop exercise to assess the actual or assumed depth of the features in relation to the top of the municipal aquifer, taking into consideration the local geological environment. The depth of municipal aquifers was interpreted using data from Tier 2 and Tier 3 water budget studies. GIS methods are described in Appendix B.

3. Vulnerability Assessment - conduct a preliminary review of potential adjustments to WHPA vulnerability ranking and scores.

3.1. Transport Pathways Inventory

In keeping with the framework presented in the Director's Technical Rules, this study looked at various anthropogenic features on the landscape within the WHPAs of municipal wells in the CVSPA. The potential pathways include both vertical elements and linear infrastructure, as presented in the following sections.

The analyses were completed for the following municipal drinking water systems:

- Town of Orangeville - Orangeville water system
- Town of Mono water system – Cardinal Woods, Island Lake, and Cole well fields
- Township of Amaranth – Pullen well
- Town of Erin water system – Erin, Hillsburgh, and Bel-Erin well fields

- Halton Region – Georgetown water system - Cedarvale, Princess Anne, and Lindsay Court well fields, and Acton water system - Prospect Park, Davidson, and Fourth Line well fields

- Peel Region – Alton, Inglewood, Caledon Village, and Cheltenham water systems

A review of transport pathways work completed by other SPRs/SPAs, revealed that the majority considered wells and boreholes, quarries and pits as the vertical transport pathways. Well and borehole analyses were based on individual wells or cluster analysis, and considered various buffer sizes (30m, 50m, 100m) for vulnerability score increases.

Linear features include municipal water mains, storm, and sanitary sewers, and petroleum pipelines. During the previous CTC study, non-uniformity in data coverage for the upper watershed and lack of digitized data on the location and buried depth of pipes was the main limiting factor in the review of linear pathways. The latter is crucial in being able to determine if these features exist in proximity to the municipal aquifer. Much of the information was only available through hard-copy engineering reports from municipal archives.

The overall availability of data has significantly improved, and more information is now available on spatial aspects of the features and improved quality of pipe dimensions. However, challenges remain with the accurate assessment of the buried depth of these features. A review of approaches implemented by other SPRs/SPAs showed similar data limitations with most opting not to include linear features.

The analyses implemented in this study are generally in line with the South Georgian Bay Lake Simcoe Source Protection Region (SGBLS SPR), Halton Hamilton Source Protection Region (HHSPR), and Lake Erie Source Protection Region (LESPR), with more conservative criteria applied to a depth of wells and linear features, and buffer size for wells and boreholes.

3.1.1 Vertical Features

Table 2 describes the vertical features assessed in this study and provides details on the assessment criteria for each.

Table 2: Criteria for transport pathways assessment of vertical features

Feature	General Criteria

Wells and Boreholes	• Well cluster analyses using the methodology proposed by Silverman (1986) • A buffer of between 30 and 100m applied • Depth to within 3 m of the top of a municipal aquifer
Quarries, Pits, and Mines	• Where the feature intersecting WHPAs • Extraction limit plus a 30 m buffer to account for the impacts beyond the extraction limit including fracturing of bedrock from blasting, slope stability, and transition zone
Stormwater Management Ponds/Sewage Lagoons	• Unconfined aquifer, unlined or of unknown construction • Apply a 15 m buffer around the feature
Landfills	• Unconfined aquifer, unlined or of unknown construction • Apply a 30 m buffer around the feature
Geothermal Systems	• Similar depth criteria for wells/boreholes • Where site-specific data is unavailable, assume a depth of 5m for shallow systems and 20 m for deep systems • Not considered in areas that are already scored as high vulnerability

Wells & Boreholes

This category includes domestic wells, inferred domestic wells, existing cluster wells, existing single domestic wells, geotechnical boreholes, monitoring wells, geothermal wells, and petrochemical (oil and gas) wells. The following criteria were applied in the selection of wells and boreholes to consider as potential transport pathways:

- Older wells (pre-1990) - this criterion assumes that wells constructed after 1990 are likely constructed to a higher standard (given that the provincial regulation governing the proper construction of water wells was released in 1990: per O. Reg. 903, 1990) and are less likely to become a transport pathway.

- Well completion depth occurs to within 3 m of the top elevation of the municipal aquifer – this was applied in both confined and unconfined conditions, although it is recognized that confinement does offer significant protection.

- Selection of a cluster of 6 or more boreholes and application of a 100m buffer or "area of influence" around the well. This range in buffer size is larger than that proposed for other vertical and horizontal features, given the cumulative nature of the impact represented by a well cluster as opposed to that created by single wells.

- Not considered in areas that are already scored as high vulnerability.

This well cluster approach used here was previously approved for the Credit Valley Assessment Report but was not included due to data quality challenges discussed in the introduction. The rationale for the method is that where the density of a potential transport pathway is greater the likelihood of a transport pathway connection may also be increased. The buffer size also takes this factor into consideration. Assessing individual wells is impractical, and single wells - particularly domestic wells- are less likely to have an impact given the diameter and pumping volume.

Quarries & Pits

A quarry or pit was considered a transport pathway if its extraction limit intersected a WHPA and a 30 m buffer was added. The buffer accounts for the impacts beyond the extraction limit, including fracturing of bedrock from blasting, slope stability, and transition zone (area between extraction limit and undisturbed bedrock or soil). The buffer limit was chosen based on the recommended setback distance from contamination in the Ontario Regulation 903. This distance has also been incorporated in the Ontario Building Code.

Mines

A mine was considered a transport pathway if its extraction limit intersected a WHPA, and a 30 m buffer was added. The buffer accounts for the impacts beyond the extraction limit, including fracturing of bedrock from blasting, slope stability, and transition zone. The buffer limit is the same as that applied to quarries and pits and was adopted from setback criteria currently applied in the protection of sensitive environmental features, as described above.

Landfills

A landfill was considered a transport pathway if its fill limit intersected a WHPA, and a 30 m buffer was added. The buffer accounts for the impacts beyond the fill limit, including slope stability and transition zone. The buffer limit was borrowed from separation criteria currently applied in the protection of sensitive environmental features, as referenced above in the quarries/pits and mines criteria.

It is recognized that more recently constructed landfills will be built to applicable codes and may include liners that prevent them from becoming transport pathways. Where relevant documentation exists, they were not considered transport pathways.

Constructed Ponds including Stormwater Management (SWM) Ponds

A pond was considered a transport pathway if the pond intersected a WHPA plus a 15 m buffer, and met the following criteria:

- Within an unconfined aquifer
- No lining or of unknown construction

It is recognized that more recently constructed SWM ponds will be built to applicable codes and may include liners that prevent them from becoming transport pathways. Where this type of data is available, the potential for representing transport pathways can be assessed accordingly.

Sewage Lagoons

Sewage lagoons were Considered transport pathways if they were in or intersect a WHPA, and meet the following criteria:

- Within an unconfined aquifer
- No lining or of unknown construction

Sewage lagoons were not assessed in most other jurisdictions, but these assumptions and considerations are consistent with those applied in the neighbouring Halton-Hamilton and Lake Erie SPRs.

Geothermal Systems

There are two main types of geothermal systems: deep vertical systems and shallow systems (which can either be vertical or horizontal). The deep vertical systems require an Environmental Compliance Approval (ECA) from MECP while the shallow systems require a building permit from local municipalities. The literature review revealed that these systems were not extensively studied across Southern Ontario. Given this, staff opted to apply the same assumptions and criteria used by the HHSPR

The following criteria were applied in the selection of geothermal systems as potential transport pathways:

- Completion depth occurs to within 3 m of the top of the municipal aquifer – this applies in both confined and unconfined conditions.
- Not considered in areas that are already scored as high vulnerability.

3.1.2 Linear Features

Table 3 describes the linear features assessed in this study and provides details on the assessment criteria for each.

Table 3: Transport pathways review - Linear features

Feature	General Criteria
Water main	• Assumed depth – 5 m below ground • Located in /intersect a WHPA • Within an unconfined aquifer • Within 3 m of the top of the municipal aquifer • Apply a 15 m buffer around the feature
Sanitary Sewers	• Assumed depth – 5 m below ground • Located in /intersect a WHPA • Within an unconfined aquifer • Within 3 m of the top of the municipal aquifer • Apply a 15 m buffer around the feature
Storm Sewers	• Assumed depth – 5 m below ground • Located in /intersect a WHPA • Within an unconfined aquifer • Within 3 m of the top of the municipal aquifer • Apply a 15 m buffer around the feature
Oil Pipelines	• Depth data received from Enbridge
Geothermal Systems	• Horizontal (closed loop) systems - assumed 5m depth • Not considered in areas with high vulnerability scores

The analysis considered the average diameter of the feature where available, in conjunction with depth. The pipe diameter was selected to represent an excavation of at least 1m or more in diameter that would need to be filled with crushed material (i.e., gravel) that can act as a transport pathway. Pipe corridors can represent both lateral and vertical transport pathways. Pipelines are installed using trenched and trenchless techniques (drilling or boring). The trenches are typically shallow, less than 2m deep, but as a conservative measure, depths of up to 5m have been assumed for this study.

Backfill into the trenches is generally not compacted to 100% of native sediments but typically close. Groundwater movement through the trench or other excavations is therefore possible. Current installation practice for water mains, storm, and sanitary sewers requires trench collars to prevent flow along them. Where this data was accessed, it was determined that these features could be excluded as transport pathways.

3.1.3 Excluded Features

The following types of infrastructure were excluded from the analysis as they are covered under Shallow Works O. Reg. 903, 1990, which includes provisions to prevent them from becoming transport pathways.

1. Municipal, municipal sentry, conservation authority owned, MTO, and private monitoring wells. These wells are regularly inspected and expected to meet O. Reg. 903, 1990.

2. Properly decommissioned wells (as defined by O.Reg. 903)

3. A test hole or other infrastructure with a depth of less than 3.0 m below the ground surface is exempt from sections 36 to 50 of the Act and from the Regulations.

4. Boring and excavations, except where the depth is within 3 m of the top of the municipal aquifer.

5. Abandoned wells - are not identified or represented in the ORGMP's database, so the analysis does not account for these features.

6. Decommissioned wells – assumed that the database appropriately identifies older wells that have been appropriately decommissioned (per O. Reg. 903, 1990).

7. Septic systems (communal/private) - assumed to be 2 m below ground surface. These systems are usually constructed at a relatively shallow depth to avoid interactions with shallow groundwater.

8. Agricultural tile drains

9. Communication infrastructure and gas mains - tend to be relatively shallow and assumed at 1 m below the ground surface. Therefore, it is highly likely that the transport pathways areas of influence already identified would capture

these features.

10. Natural water features (i.e., ponds and watercourses) – are not considered as these features are already accounted for in the WHPA-E analyses.

3.2 Groundwater Vulnerability Assessment

Transport pathways circumvent the natural protection provided by overlying soil and rock confining layers, resulting in an increase in vulnerability and a greater risk of contamination of the aquifer complexes that provide municipal drinking water supplies. The existence of such pathways can justify an increase in the vulnerability ranking for these aquifers. The provisions of the technical rules allow for the adjustment in the area vulnerability – and possibly in the vulnerability score - due to the presence of a transport pathway. The vulnerability ranking can only be assessed as low, medium, or high, so if a vulnerable area already has a rank of "high", the vulnerability score cannot be increased due to the presence of transport pathways.

Vulnerability adjustments may be increased by one or more ranks and are based on professional judgment. An adjustment in a vulnerability score within a WHPA could result in the identification of additional threats and the application of Source Protection Plan policies.

In the approved AR, the vulnerability assessment of municipal aquifers was assessed using methodologies prescribed through Technical Rule 37 (Part IV). In the CVSPA, the following methodologies were applied:

(1) Intrinsic Susceptibility Index (ISI)

(2) Aquifer Vulnerability Indices (AVI)

(3) Surface to Well Advection Times (SWAT)

These methodologies were applied in the various municipalities of the CVSPA, as shown in Table 4.

Table 4: Groundwater vulnerability assessment methods applied in CTC Vulnerable Areas

Municipality	Water System	Vulnerability Assessment Method
Dufferin Region – Towns of Orangeville, Mono, Amaranth Township	Orangeville Mono – Cardinal Woods, Island Lake, Coles Amaranth - Pullen well	Aquifer Vulnerability Index (AVI)

Wellington – Town of Erin	Erin – Erin, Hillsburgh, Bel-Erin	Intrinsic Susceptibility Index (ISI)
Halton Region – Towns of Acton and Georgetown	Acton – Prospect Park, Davidson, Fourth Line Georgetown – Cedarvale, Princess Anne, Lindsay Court	Surface to Well Advection Time (SWAT) (UZAT =0)
Peel Region – Town of Caledon	Alton, Inglewood, Caledon Village, Cheltenham	Surface to Well Advection Time (SWAT) (UZAT =0)

The ISI and AVI methods use the interpreted products of geological and numerical models to produce a numerical index that represents the relative vulnerability of an aquifer, based on the type and thickness of the soil above it. A full review of these methodologies is presented in Chapter 4 of the CVSPA AR.

If the layer above is thick and dense (e.g., clay or till), then the AVI score will be low whereas if the layer above is thin and or porous (e.g., Sand or gavel), then the AVI will be higher. This implies that confined aquifers are lower in vulnerability for the protective cover.

The ISI and AVI approaches are very similar, except the ISI also considers the static water level in the well and requires that the uppermost aquifer be at least partially saturated (MOE, 2006). This Vulnerability method is often used in the broader context where site-specific WHPA information or models may not be available.

The SWAT method uses numerical models to assess the time of travel through the unsaturated portion of the subsurface (Unsaturated Zone Advection Time – UZAT) plus the time of travel from a water table, through the aquifer to a municipal well (Water Table to Well Advection Time – WWAT). A modified SWAT (UZAT + WWAT) was applied in several municipalities of the CTC, where a zero time-of-travel was approximated in the unsaturated zone (UZAT). This approach is more specific to the WHPA as the model is built to include local conditions.

Each method produces a numerical index that represents the relative vulnerability of an aquifer to sources of contamination at or near the surface, and through a translation process (prescribed through the technical rules) categorizes vulnerability as low, medium, or high in accordance with the Provincial guidance. The groundwater vulnerability is then converted into a vulnerability score (per Technical Rules 82 - 85) which provides the ultimate expression of the groundwater vulnerability

Per provisions of the Director's Rules, all WHPA-A are given a vulnerability score of 10, without considering the geological setting. This is to be conservative given that

this is the 100 m surrounding the municipal water supply well. The scoring within the WHPA B to D, based on the AVI, ISI, and SWAT methodologies, are presented in Table 5.

Table 5: Vulnerability scoring in Wellhead Protection Areas

WHPA Zone	Vulnerability Score by SWAT Methodology			Vulnerability Score by ISI & AVI Methodology		
	Low (>25 yrs)	Medium (5-25 yrs)	High (< 5 yrs)	Low (>80)	Medium (30-80)	High (<30)
Zone A	10	10	10	10	10	10
Zone B	6	8	10	6	8	10
Zone C	2	6	8	4	6	8
Zone D	2	4	6	2	4	6

Modifications in the vulnerability ranking/scoring within WHPAs may impact the threat enumeration and assessment presented in Chapter 5 of the CVSPA AR. An update of threat enumerations is outside the scope of this study but would need to be undertaken if the CVSPA AR were to be amended.

The potential for the creation of a transport pathway is dependent primarily upon the nature of the overburden removed, the depth of excavation, and the type of material that lies between the base of the excavation and the municipal aquifer. The analyses were undertaken by applying the basic procedure outlined in section 3, in conjunction with Technical Rule 41.

Per Technical Rule 41, the factors considered in the identification of transport pathways, evaluation of the applicable spatial footprint, and the magnitude of the potential vulnerability adjustment, include:

- Wellhead Protection Area (WHPA) - analyses completed for zones -A to -D, as the intrinsic vulnerability/scoring is a partial product of the local geology and is influenced by the permeability and porosity of the geologic unit. Zone-E (WHPA -E) was not included since its vulnerability scoring already incorporates a direct hydrological connection between the surface catchment and the municipal aquifer.

  The broader landscape outside of the WHPAs was not considered in this work, as the primary focus of the provincial source water protection program is the protection of municipal drinking water supplies.

- Hydrogeological conditions - where municipal wells are screened in deeper aquifer systems, they are likely less vulnerable because of the protection provided by lower permeability materials that lie above them and serve to confine these systems (aquitards). This is the case in the CVSPA, where several municipal aquifers are protected from activities at the surface by low permeability deposits of varying thicknesses.

- The nature and design of transport pathways, i.e. the physical characteristics of the feature, must be considered to determine if it extends to the water table, breaches the confining layers above the aquifer(s) of interest, or if it extends to within a certain depth of, or goes below, the water table.

- Cumulative impacts - where the density of potential transport pathways is greater, the likelihood of a transport pathway connection may also be increased. This is a concern when looking at the impact of a single well/borehole versus a cluster of wells in the same area. Single wells - particularly domestic wells - are less likely to have an impact given the smaller diameter and pumping volume. It should be noted that the responsibility for private water well maintenance lies with the homeowner. Regulation 903 provides guidance for the protection and maintenance of privately-owned domestic wells. This analysis is focused on the potential impact of clusters of wells as pathways to the municipal supply rather than on the condition of each well.

- Finally, vulnerability score - in areas already identified as high aquifer vulnerability, transport pathways would provide no further risk to the water quality of the aquifer. Here, no additional modifier can be applied. Conversely, in areas where natural groundwater protection is reflected in a medium or low vulnerability classification, artificial pathways through (or partially through) the confining layers may increase the vulnerability to a medium (or high) classification.

4. Findings

The findings of the study are summarized in Table 6, and additional detail and specifics on the review of each feature are presented in the sub-sections below. The recommendations presented in this report (transport pathways and vulnerability scoring adjustments) are drafted for discussion with municipal partners and based on currently available data. It should be noted that many of the municipalities within the CVSPA have updates to WHPA mapping and vulnerability assessments for one or more of their water systems either currently underway or anticipated in the next few

years. As a result, the shape and size of existing WHPAs may change and transport pathways re-assessed prior to any amendment of the CVSPA AR.

Table 6: Results - Summary of Transport Pathways in the CVSPA

Municipality		Wells		Vulnerability Method	Comments
Dufferin	Orangeville	12	2A, 5/5A, 7, 9A/9B, 6, 11, 8B, 8C, 12, 10	AVI	• A review of the ORGMP database identified a cluster of 7 wells as transport pathways. • There are four aggregate operations identified within the WHPAs, located within the municipalities of Amaranth, East Garafraxa, and Caledon. • SWM ponds - four locations were identified as transport pathways to municipal aquifers. • Water mains at three locations were identified as potential risks to municipal aquifers; sanitary lines exist, but were not identified as transport pathways • There are no mines, landfills, sewage lagoons, or oil pipelines within the WHPAs.
	Mono	8	Cardinal Woods (MW-1, MW-3, MW-4) Coles (1 & 2), Island Lake (PW-1, PW-2-06, TW-1)		• The municipal aquifer is generally protected by an upper aquitard and the risk posed by shallower features is assumed to be low. • A review of the ORGMP database identified 69 water wells within the WHPAs but none were classified as transport pathways. • There were no aggregate operations identified within the WHPAs. • SWM ponds - two locations at Island Lake were identified as potential risks to municipal aquifers. • There are no mines, landfills, water mains, sewer lines, sewage lagoons, oil pipelines, or sewer lines.
	Amaranth	1	Pullen Well		• A review of the ORGMP database identified 9 water wells within the WHPAs but classified none as transport pathways. • There were no aggregate operations identified within the WHPAs • There are no mines, landfills SWM ponds, water mains, sewer lines, sewage lagoons, oil pipelines, or sewer lines.

Municipality		Wells		Vulnerability Method	Comments
Wellington	Erin	5	Erin Village (E7 & E8) Hillsburgh Village (H2 & H3) Bel Erin	ISI	• A review of the ORGMP database identified a cluster of 8 wells in Hillsburgh as transport pathways. • There is one aggregate operation at Hillsburgh; A former landfill site was identified in Hillsburgh, but it has been closed for many years. • There are no mines, water mains, sewer lines, sewage lagoons, oil pipelines, or sewer lines.
Halton	Acton	5	4th Line, Davidson (1 & 2), Prospect Park (1 & 2)	SWAT	• A review of the ORGMP database identified no well clusters as transport pathways. • Water mains, SWM ponds, and sewer lines exist but were not identified as transport pathways. • There are no mines, landfills, oil pipelines, or sewage lagoons.
	Georgetown	7	Lindsay Court (9), Princess Anne (5 & 6), Cedarvale Park (1-A, 3-A, 4 & 4-A)		• A review of the ORGMP database identified 2 clusters of deep-water wells (greater than 20 m below the recorded static elevation) identified as transport pathways. • There is one aggregate operation identified in the WHPA D. • Water mains, SWM ponds, and sewer lines exist but were not identified as risks. • There are no mines, landfills, oil pipelines, or sewage lagoons.
Peel	Caledon	8	Alton (3 & 4), Caledon Village (3 & 4), Inglewood (2 & 3), Cheltenham (PW-1/PW-2)	SWAT	• A review of the ORGMP database identified clusters of 6 wells and 28 wells within WHPAs around Inglewood and Alton, respectively, as transport pathways. • One aggregate operation was identified at Alton, and another at Caledon Village. The latter was previously identified in the approved AR. • A water main at one location was identified as a potential risk to municipal aquifers. • SWM ponds and sewer lines exist but were not identified as transport pathways. • There are no mines, landfills, oil pipelines, or sewage lagoons.

4.1 Vertical Transport Pathways

Wells and Boreholes

Table 7 summarizes the results of the analyses of non-municipal wells/boreholes within WHPAs of CVSPA. The identified transport pathways are presented in **Figures 1** through **6** in Appendix C.

Table 7: Wells Identified as Transport Pathways

Water System	Well ID (WHPA)	Vulnerability Score	Well Cluster (100m radius)	Location of Pathway	Municipality
Orangeville	6 & 11 (B)	6, 8	7 wells	Hilltop Crescent	Township of East Garafraxa
Alton	3 &4A (B, C & D)	2, 4, 6, 8	28 wells	Queen Street West & Regional Road 136	Town of Caledon
Hillsburgh	H3 (B)	8	8 wells	Orangeville Street & Barker Street	Town of Erin
Georgetown	D	4	Two clusters of 7 & 16 wells	22nd Sideroad & Highway 7	Town of Halton Hills

It is recommended that the buffer area around these clusters receive an increase in the vulnerability rating by one category: low to medium or medium to high. This in turn results in an increase in vulnerability score. Where the rating is already high, no change is required. The vulnerability score changes pertaining to this transport pathway are summarized in Table 8.

Well clusters were not identified as transport pathways within the WHPAs of Amaranth, Mono, Acton, Erin, Bel-Erin, Caledon Village, and Cheltenham.

It is recommended that a field survey be completed within WHPA-A and if practical WHPA-B to identify unused/abandoned wells and/or wells that do not comply with current well construction requirements. Such wells ought to be properly decommissioned per provisions of O. Reg. 903, 1990.

Table 8: Recommended Vulnerability Updates – Well Clusters

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)[1]
Georgetown	medium	4	660.9	19.09	4 to 6	high	3.0
Hillsburgh	medium	8	18.9	6.38	8 to 10	high	34.0
Alton	low	2 & 6 (B)	568.8	10.36	2 to 4; 6 to 8	medium	2.0
	medium	4, 6 & 8	33.2	5.78	4 to 6; 6 to 8 8 to 10	high	17.0
Orangeville	low	6 (B)	254.8	6.34	6 to 8	medium	2.0
	medium	8	224.8	1.33	8 to 10	high	1.0

[1] For example, 3.0% of the Georgetown WHPA is recommended to be adjusted from a vulnerability score of 4 to 6.

Quarries & Pits

The review of pits and quarries as transport pathways was completed on a site-specific basis. Nine (9) active pit and quarry operations have been identified as transport pathways and are listed in Table 9. Of these operations, 7 are in the upper watershed, while the other two occur in the middle watershed. The identified transport pathways are presented in **Figures 7** through **12**.

Most of the pits are Category 3 - Class A above water type. However, those in Alton, Caledon Village, and Orangeville, extend below the water table.

Table 9: Active Pits and Quarries identified as Transport Pathways

Water System	Well ID (WHPA)	Vulnerability Score	Location of Pathway	Municipality
Cardinal Woods	1,3,4 (B, C & D)	4, 6, 8	Hockley Road & Blind Line	Town of Mono
Amaranth	Pullen (B, C &D)	2,4	2nd Line WHS	Township of Amaranth
Orangeville	8B,8C,12, (B, C & D)	2, 4, 6	2nd Line WHS	Township of Amaranth
	2A,5,5A, 7, 9, 9A, B (D)	2	3rd Line WHS	Township of Amaranth

Water System	Well ID (WHPA)	Vulnerability Score	Location of Pathway	Municipality
	6,11 (B, C & D)	2, 4, 6	A Line & Carriage Road	Township of East Garafraxa
	10 (D)	2, 4	Willoughby Road	Town of Caledon
Alton	3 &4 (D)	2	Canadian Pacific Railway & Regional Road 136	Town of Caledon
Caledon Village	3 (B, C & D)	2, 4, 6, 8	South of Hwy 24, West of Troiless Street	Town of Caledon
Hillsburgh	H2, H3 (D)	2	County Road 24 & 27 Sideroad	Town of Erin
Georgetown	D	4	22nd Sideroad & Highway 7	Town of Halton Hills

It is recommended that the 30 m buffer area around these pits and quarries receive an increase in the vulnerability rating by one category: low to medium or medium to high. This in turn results in an increase in vulnerability score. Where the vulnerability rating is already high, no change is required. The vulnerability score changes pertaining to this transport pathway are summarized in Table 10.

Quarries and pits were not identified as transport pathways within the WHPAs of Amaranth, Acton, Erin, Bel-Erin, Inglewood, and Cheltenham.

Table 10: Recommended Vulnerability Updates – Quarries and Pits

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)[1]
Alton	Low	2	502.5	29.4	2 to 4	medium	6.0
Hillsburgh	Low	2	150.5	54.6	2 to 4	medium	36.0
Georgetown	Medium	4	660.9	17.2	4 to 6	high	3.0
Mono	Medium	4 (D), 6 (C) & 8	102.4	5.3	4 to 6; 6 to 8; 8 to 10	high	5.0
Amaranth	Low	2,4,6	580.44	30.7	2 to 4; 4 to 6 6 to 8	medium	5.3
Orangeville	Well 10 - Low	2	16.9	15.7	2 to 4	medium	93.0

	Well 6 - Low	2, 4 & 6	516.6	50.0	2 to 4; 4 to 6; 6 to 8	medium	10.0
	Well 7 - Low	2 & 4	415.9	34.8	2 to 4; 4 to 6;	medium	15.0
	Well 10 - Medium	4	24.4	12.7	4 to 6	high	53.0
Caledon Village	Low	2, 6	70.8	34.8	2 to 4; 4 to 6; 6 to 8	medium	50.0
	Medium	6 (C) & 8	34.9	3.4	6 to 8; 8 to 10	high	10.0

Mines

There are no mines identified as transport pathways within CVSPA WHPAs.

Landfills

There are no active landfills identified as transport pathways within CVSPA WHPAs.

Stormwater Management (SWM) Ponds

Table 11 summarizes the results of the analysis of SWM ponds as transport pathways within CVSPA. In Orangeville, there are a total of 4 ponds at 4 locations in the WHPAs pertaining to wells 2a, 5, 6, 7, 8B, 8C, 9A, B, 10, and 11. In Mono, there are a total of six ponds at 2 locations in the WHPAs pertaining to the Island Lake water system in the Town of Mono. The identified transport pathways are presented in **Figures 13** through **15**.

Table 11: SWM Ponds identified as Transport Pathways

Water System	within WHPA	Vulnerability Score	Location	Municipality
Orangeville (Well 8B & 8C)	B	8	Blind Line	Town of Orangeville
Orangeville (Well 2a, 5, 7 & 9 A, B)	B	6 & 8	Highway 9, Canadian Pacific Railway	
Orangeville (Well 6 & 11)	B	8	Riddell Road,	
Orangeville (Well 10)	B	8	Marshall Crescent	
Mono-Island Lake	B, C	6, 8	1st Line EHS & Blue Heron Dr	Town of Mono

	C	4, 6	2nd Line EHS & Highway 9	

It is recommended that the 15 m buffer area around these ponds receive an increase in the vulnerability rating by one category: low to medium or medium to high. This in turn results in an increase in vulnerability score. Where the rating is already high, no change is required. The vulnerability score changes pertaining to this transport pathway are summarized in Table 12.

SWM ponds were not identified as transport pathways within the water systems of the Township of Amaranth, Halton Region, Town of Erin, or Peel Region.

Table 12: Recommended Vulnerability Updates – SWM Ponds

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)[1]
Orangeville	medium	8	578.3	9.1	8 to 10	high	2.0
Mono	Medium	6 (C) & 8	56.9	4.5	6 to 8; 8 to 10	high	8.0
	Low	4 & 6 (B)	43.2	0.8	4 to 6; 6 to 8	medium	2.0

Sewage Lagoons

There are no lagoons identified as transport pathways within CVSPA WHPAs.

4.2 Linear Transport Pathways

Table 13 summarizes the results of the analysis of linear infrastructure within WHPAs of CVSPA. Water mains were the only identified linear (horizontal) transport pathway, as shown in **Figures 16** through **19**.

Table 13: Linear features identified as Transport Pathways

Water System	Well ID (WHPA)	Vulnerability Score	Feature	Location of Pathway	Municipality
Orangeville	2A,5,5A, 7, 9A & B	6, 8	Water Main	Passmore Ave, Highway 9 & Blind Line, Montgomery Boulevard & Redfern Street	Town of Orangeville
Caledon Village	CV 3 (B, C)	4, 6, 8	Water Main	Highway 10	Town of Caledon

It is recommended that the 15 m buffer area around these features receive an increase in the vulnerability rating by one category: low to medium or medium to high. This in turn results in an increase in vulnerability score. Where the rating is already high, no change is required. The vulnerability score changes pertaining to this transport pathway are summarized in Table 14.

Linear features were not identified as transport pathways within the Township of Amaranth, Town of Mono, Halton Region, Town of Erin, or the WHPAs of the Alton, Inglewood, or Cheltenham water systems in the Peel Region.

Table 14: Recommended Vulnerability Updates – Water Mains

Water System	Existing Vulnerability Rating	Vulnerability Score	WHPA Area (ha)	TP Area (ha)	Proposed Vulnerability Score change	Proposed Rating Change	Change of Area per new TPs (%)[1]
Orangeville	Low	6	363.3	3.3	6 to 8	medium	1.0
	Medium	8	126.8	0.5	8 to 10	high	0.40
Caledon Village	Low	2 & 6 (B)	31.7	0.8	4 to 6; 6 to 8	medium	3.0
	Medium	8	7.5	0.2	8 to 10	high	3.0

Authors and Acknowledgements

This technical study was undertaken by Credit Valley Conservation staff Kerry Mulchansingh (Program Manager, Hydrogeology) and Parastoo Hosseini (GIS lead & Specialist- Information Management), with significant input from Michael Thorpe (Manager- IT and Infrastructure).

The analyses and assessment benefitted greatly from discussion and review with Conservation Ontario, and with staff from other SPRs in the province.

Gratitude must also be extended towards CTC Source Water Protection program leads Janet Ivey, Behnam Doulatyari, and Craig Jacques, Technical Advisor Gayle Soo Chan, SPA subject experts Don Ford, Hailey Ashworth, Rod Wilmot, Godofredo Carpio, Daniela MacLeod and members of the Municipal Implementation Working Group (MIWG), for their valuable input and assistance during the review process. Former CTC program lead, Jennifer Stephens must also be recognized for her guidance and input during the initial phases of this work.

This study was endorsed by the CTC SPC on December 7, 2022.

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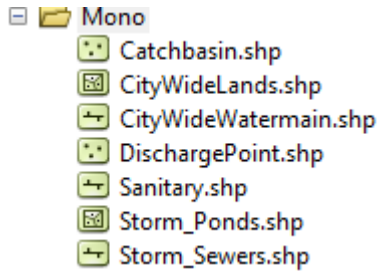
Appendix A: Data Sources

Municipality	Source	GIS data	Data Sharing Agreement	Metadata
Orangeville	Orangeville Partner Hub	Sanitary_Network.zip Storm_Network.zip Storm_Network_Pond.zip Water_Network_View-shp.zip	No	No
Halton Region	Via email	HaltonRegion ARIP184_Bedrock_Quarries_HH.shp Credit Valley.mxd HH_Boundary.shp Land_Fill_Site_HH.shp MNR_Pit_Quarry_HH.shp Sewer_Facility.shp SewerMain.shp STM_Catch_Basin.shp STM_Channel.shp STM_Driveway_Culverts.shp STM_Fitting.shp STM_Geometric_Net_Junctions.shp STM_InletOutlet_Structure.shp STM_Lateral.shp STM_Maintenance_Hole.shp STM_Monitoring_Location.shp STM_OGS.shp STM_Retention_Structure.shp STM_Roadway_Culvert.shp STM_Structure_Outline.shp STM_SWM_Pond.shp STM_SWMPond.shp STM_Virtual_Point.shp StormMain.shp VU_IMS_Streetview.shp WaterMain.shp WWTP_Boundaries_HH.shp	Yes	Yes
Region of Peel	via email	Aggregate_Properties_PltQueeries_WHPA ClosedPrivatePublic_Landfills_WHPA StormWaterManagementPonds_WHPA Water_Wastewater_Storm_Main	No	No, only available for SWM ponds

Municipality	Source	GIS data	Data Sharing Agreement	Metadata
Mono	via ArcGIS Online		No	No
Wellington	via email	wcLandfills.shp	No	No
Ontario GeoHub (LIO)	download	Aggregate_Site_Authorized_-_Active	No	Yes

Appendix B: Transport Pathways GIS Methods

Vertical Infrastructure

A. Well/Borehole:

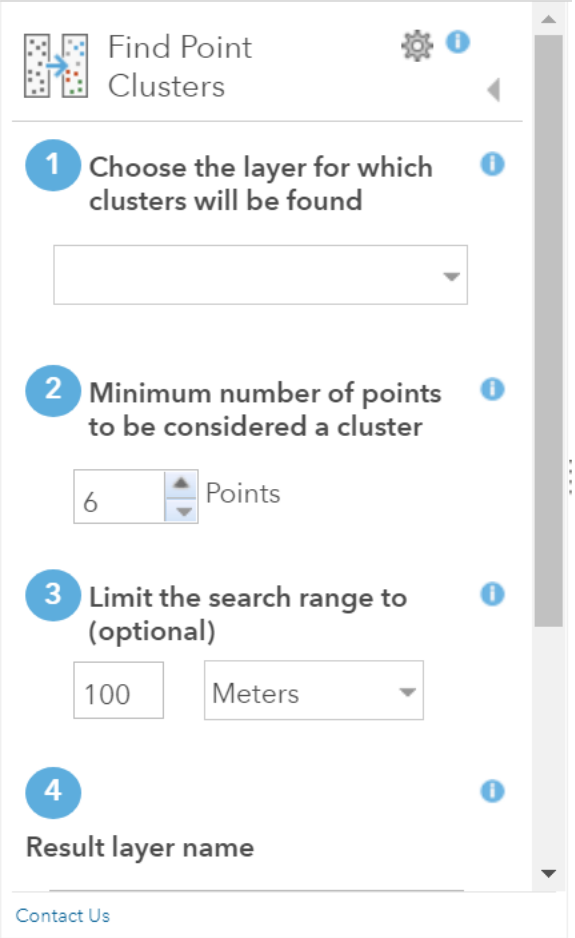
The following criteria were applied in the review of wells and boreholes:

a) Screen out well / borehole clusters within areas that are already scored as high vulnerability.

b) Select older well (pre-1990) - this criterion assumes that wells constructed after 1990 are likely constructed to a higher standard (per O. Reg. 903, 1990) and are less likely to become a transport pathway.

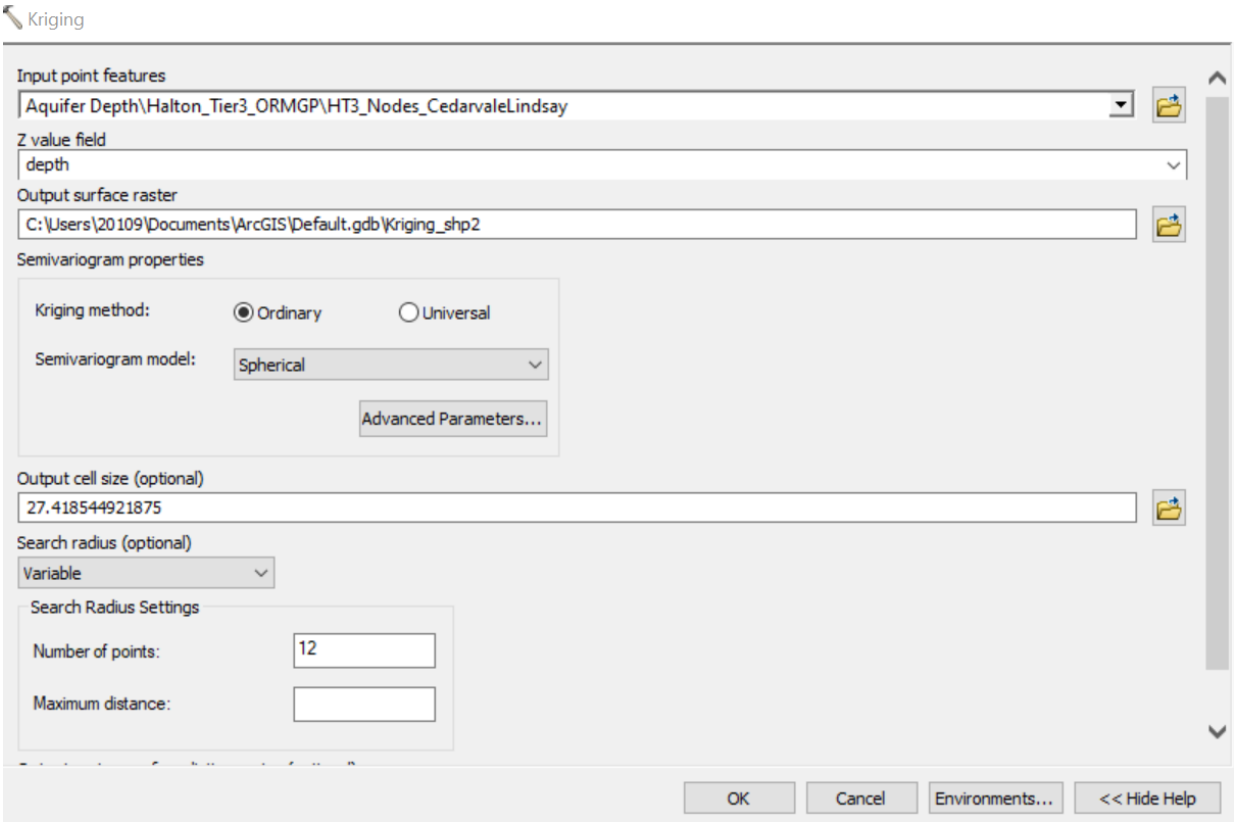
c) Selection of a cluster of 6 or more boreholes and application of a 100m buffer using the Find Point Clusters tool in ArcGIS Enterprise (Or using ArcPro with the GeoAnlytics extension – ESRI software). The Find Point Clusters tool finds clusters of point features within surrounding noise based on their spatial distribution:

- Publish the boreholes layer to the ArcGIS Enterprise
- Open this feature class in Map Viewer
- Select Analysis > Analyze Patterns > Find Point Clusters
- This tool screens out clusters of 6 boreholes and more within a 100m radius.



d) Well completion depth occurs within 3 m of the upper elevation of the municipal aquifer. Numerical models from ORMGP were used to create a surface with the depth of aquifer info for WHPAs in CVSPA:

- The numerical models contain the top of the model (ground surface elevation) followed by the bottoms of each subsequent layer, ordered downward. To calculate the depth of the aquifer, subtract the aquifer elevation from the ground surface elevation.
- Use the "Kriging" tool to create a raster surface with the depth as "Z value field" and "Output cell size" as 5m.



- Use the raster surface data (output from the Kriging tool) to compare the depth of boreholes clusters with the depth of the aquifer in each WHPA to screen out boreholes that do not intersect with municipal aquifers

e) Apply a 100m buffer to the selected boreholes clusters

B. Mines, Pit, and Quarries:

a) Intersect pit and quarries with WHPA A-D
b) Apply a 30 m buffer that accounts for the impacts beyond the extraction limit including fracturing of bedrock from blasting, slope stability, and transition zone.

C. Landfills:

a) Intersect landfill with WHPA A-D
b) Apply a 30 m buffer around the selected feature

Not to be considered where design specs are available and indicate that landfills are lined.

D. Stormwater Management Ponds (SWM) and Sewage Lagoons:

a) Intersect SWP pond or lagoon with WHPA A-D
b) SWM ponds should intersect with an unconfined aquifer
c) Apply a 15 m buffer around the selected feature

Not to be considered where design specs are available and indicate that ponds are lined.

Linear Infrastructure

A. Municipal water mains, storm, and sanitary sewer:

a) Intersect with WHPA A-D
b) Linear features should intersect with an unconfined aquifer
c) Occur within 3m of the top of a municipal aquifer
d) where depth data is not available, 5 meters below ground surface is assumed
e) Apply a 15 m buffer around the identified linear feature

Appendix C: Figures

Figure 1: Transport Pathways related to wells and boreholes: East Garafraxa; recommended change in vulnerability rating – medium to high

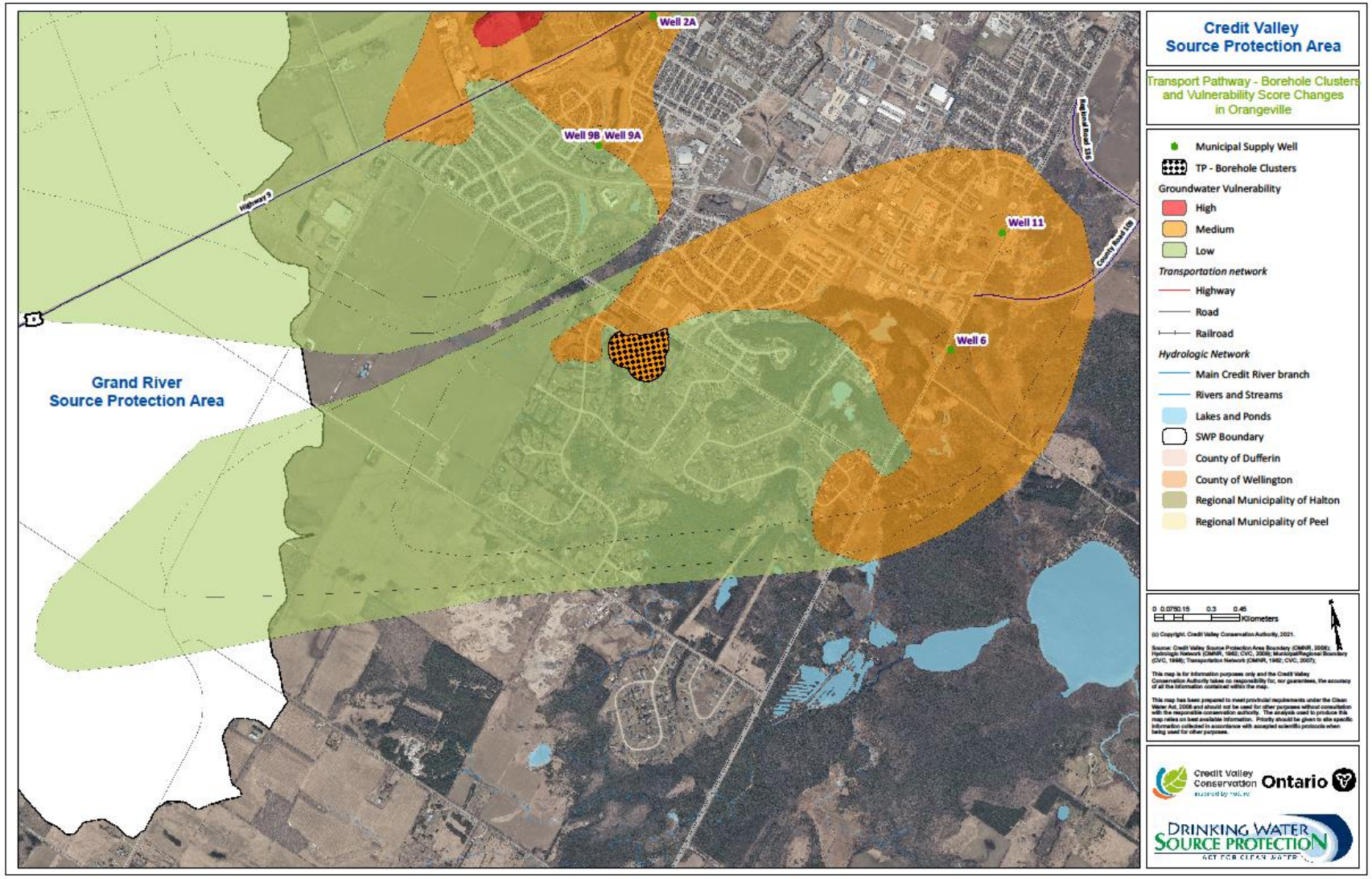


Figure 2: Transport Pathways related to wells and boreholes: East Garafraxa; recommended change in vulnerability rating – medium to high

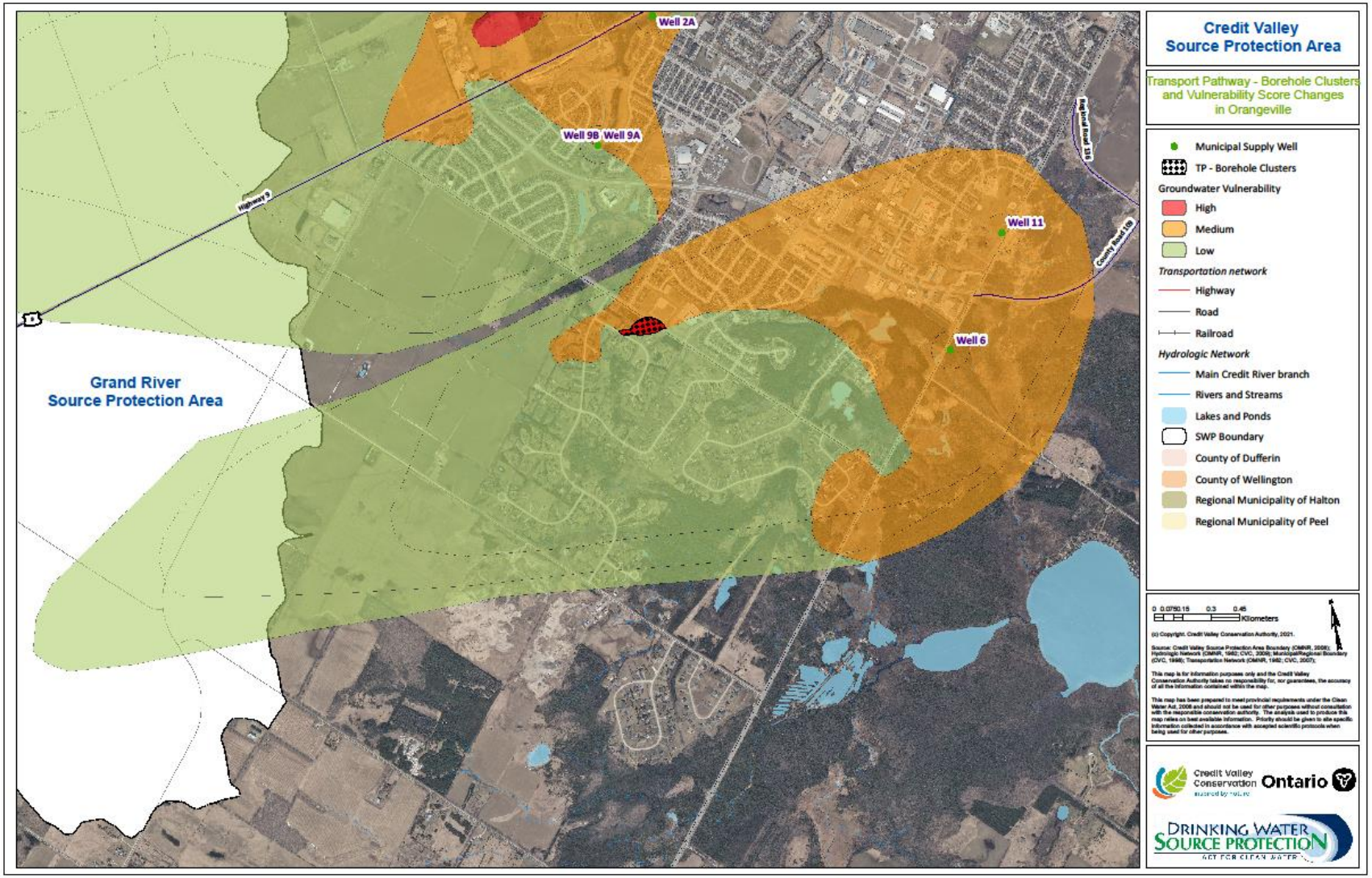


Figure 3: Transport Pathways related to wells and boreholes: Hillsburgh; recommended change in vulnerability rating – medium to high

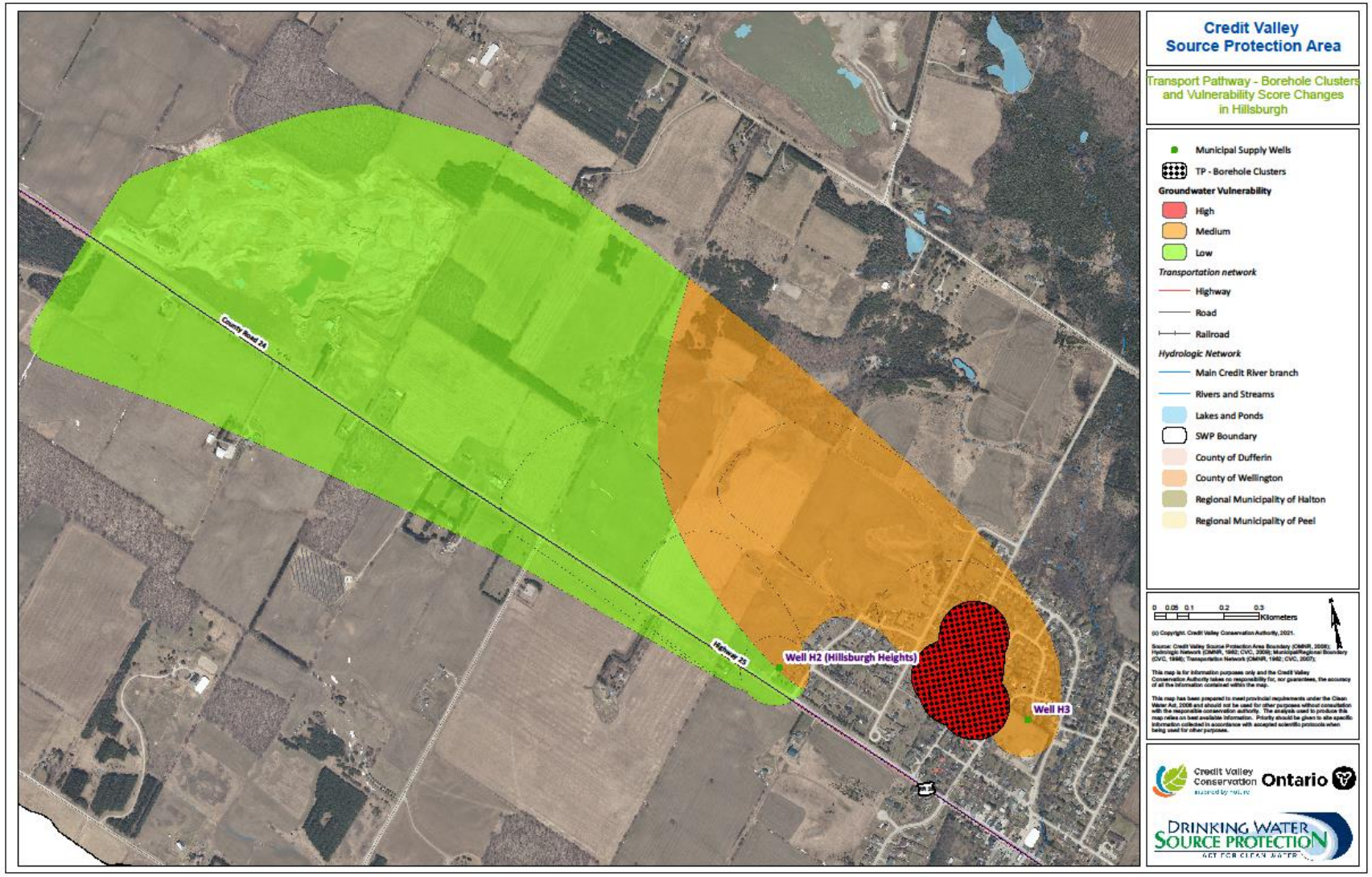


Figure 4: Transport Pathways related to wells and boreholes: Georgetown; recommended change in vulnerability rating – medium to high

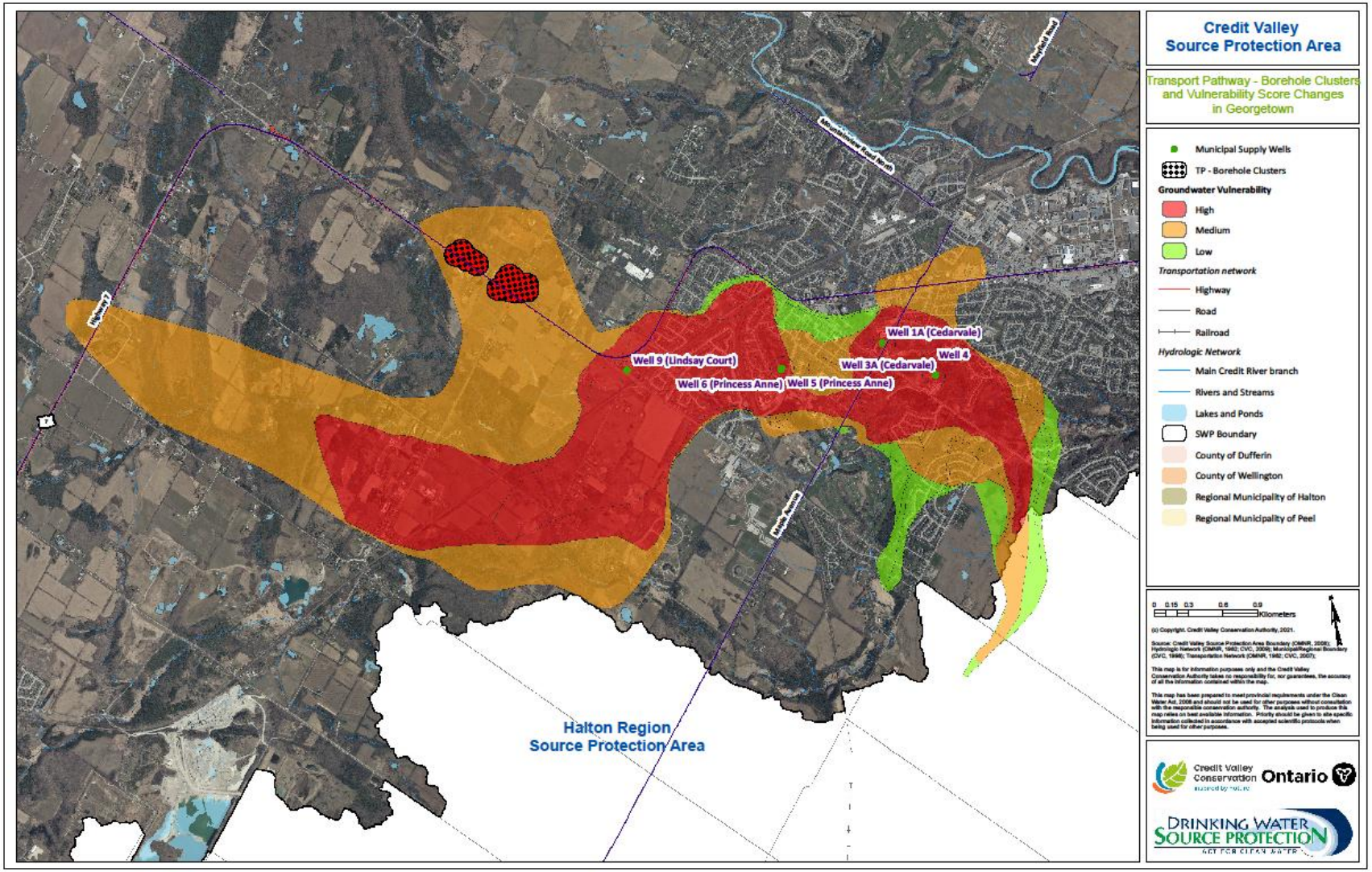


Figure 5: Transport Pathways related to wells and boreholes: Alton; recommended change in vulnerability rating – low to medium

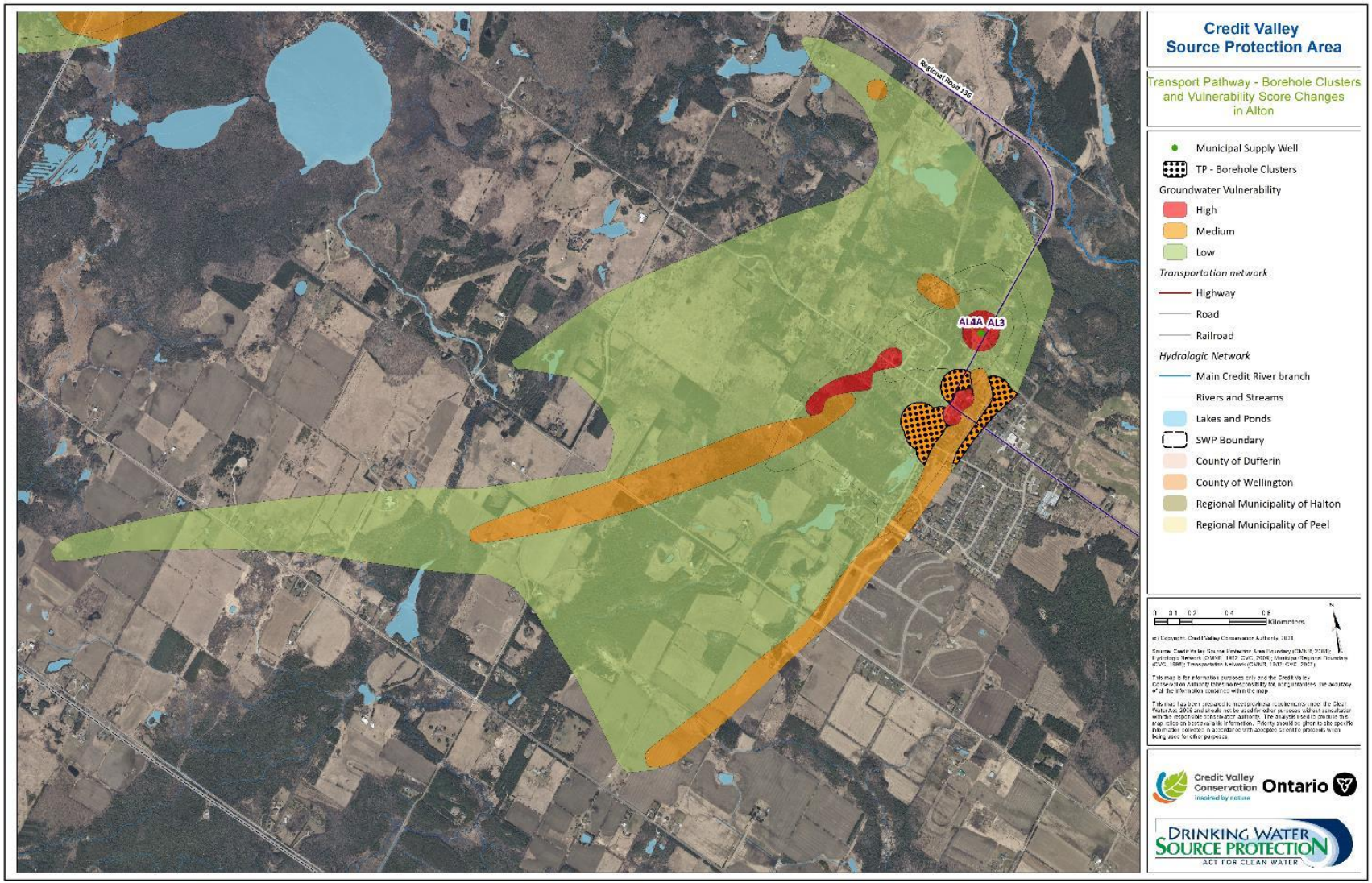


Figure 6: Transport Pathways related to wells and boreholes: Alton; recommended change in vulnerability rating – medium to high

Figure 7: Transport Pathways related to aggregates: Mono; recommended change in vulnerability rating – medium to high

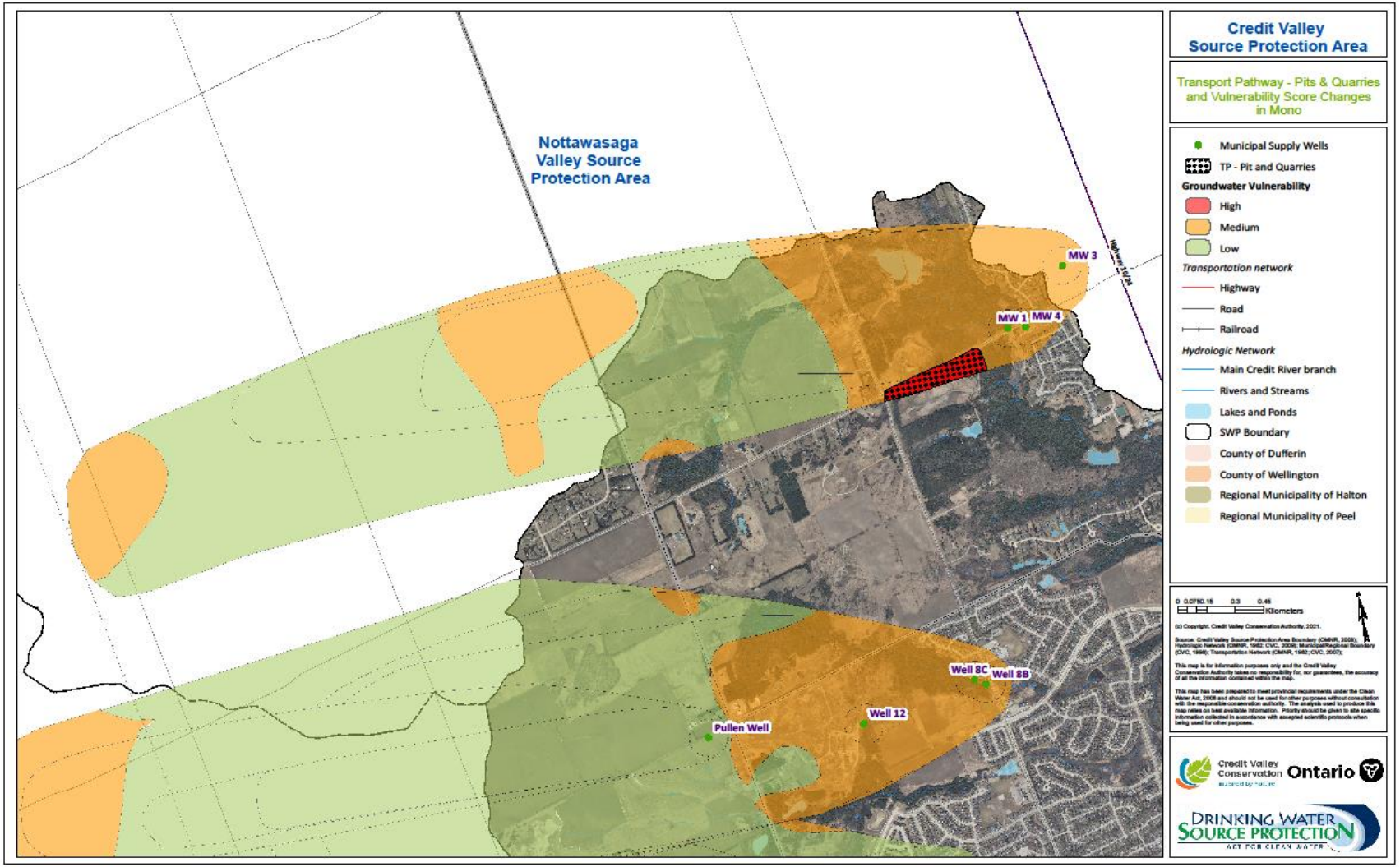


Figure 8: Transport Pathways related to aggregates: Amaranth & East Garafraxa; recommended change in vulnerability rating – low to medium

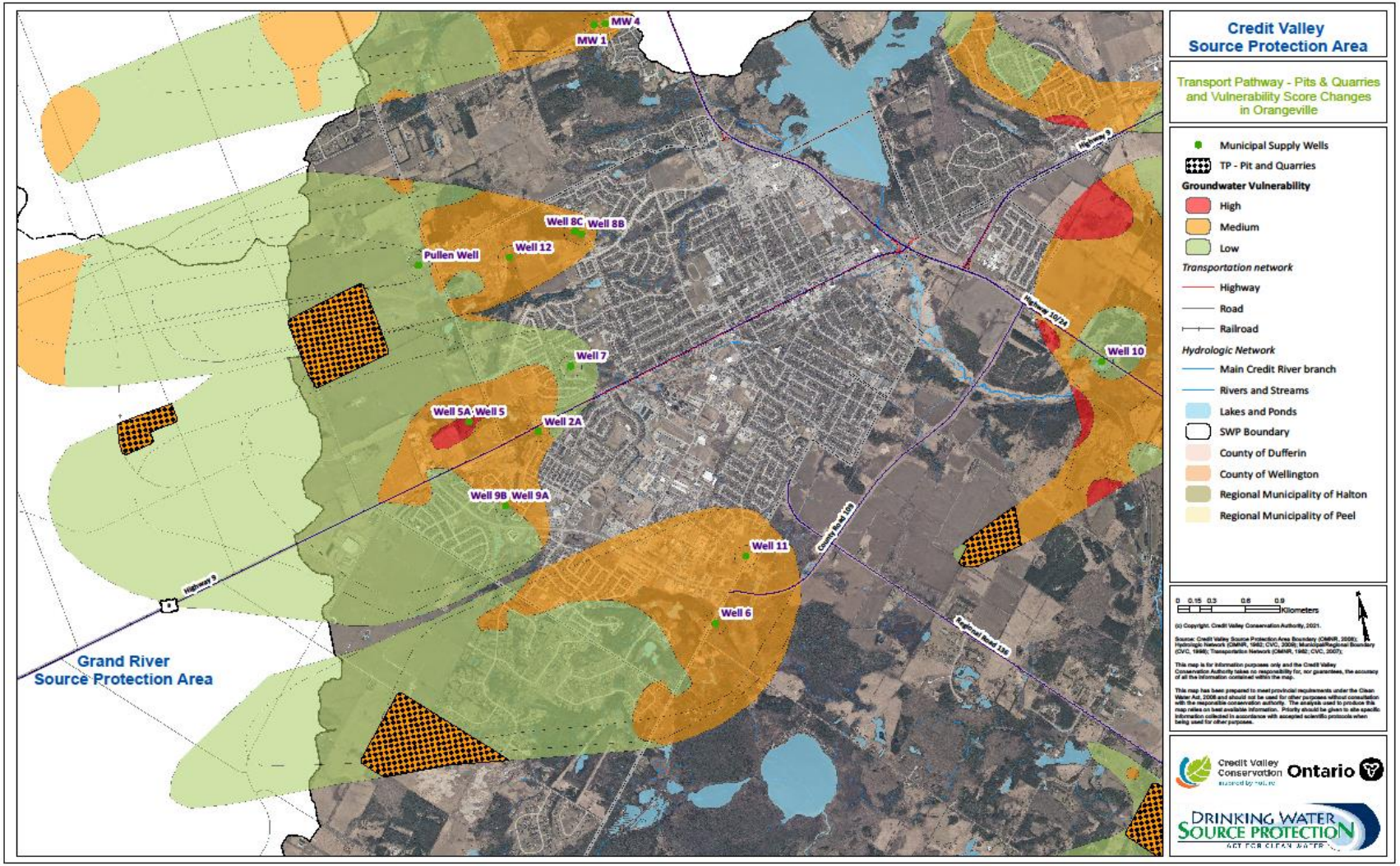


Figure 9: Transport Pathways related to aggregates: Alton; recommended change in vulnerability rating – medium to high

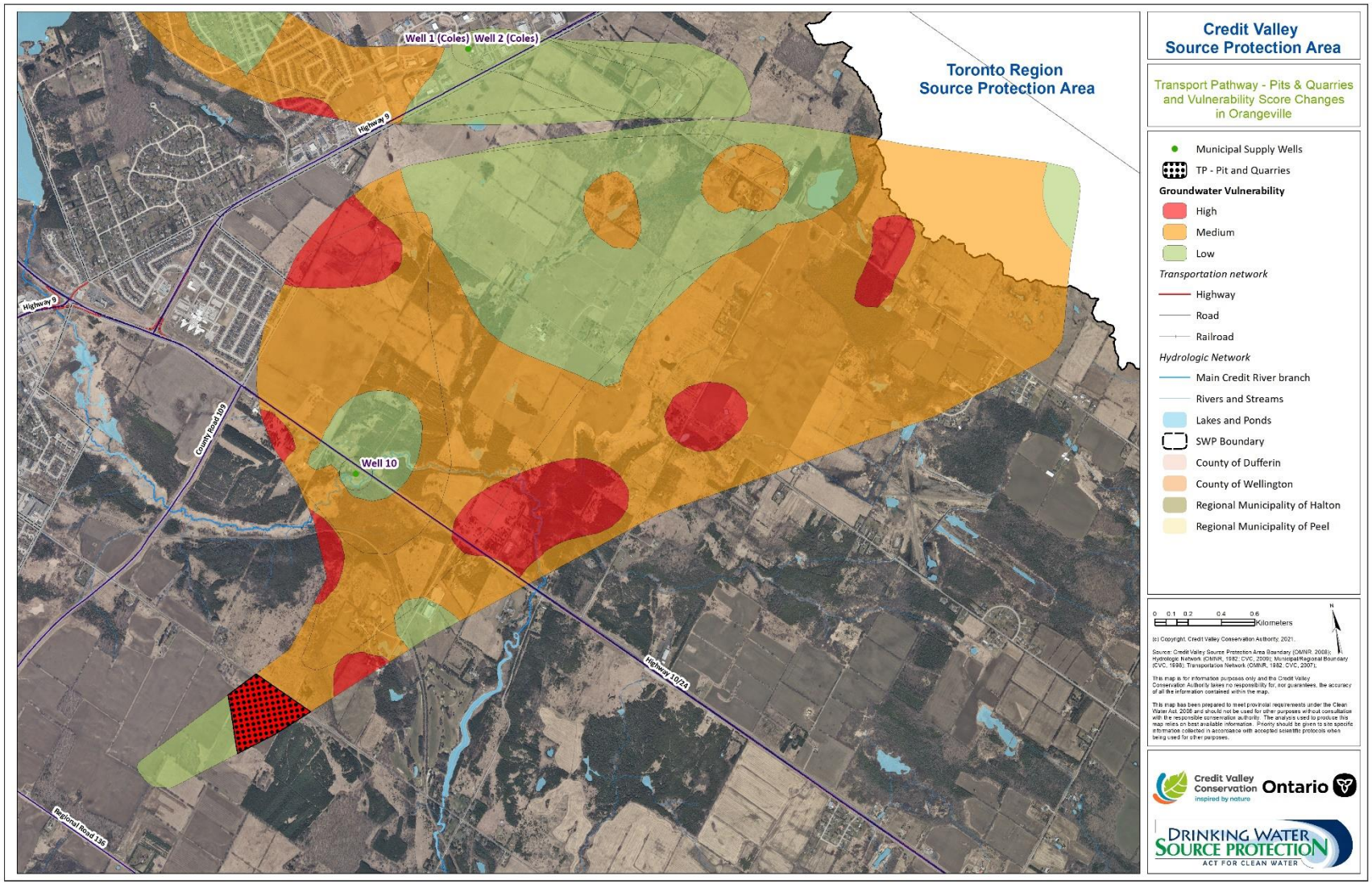
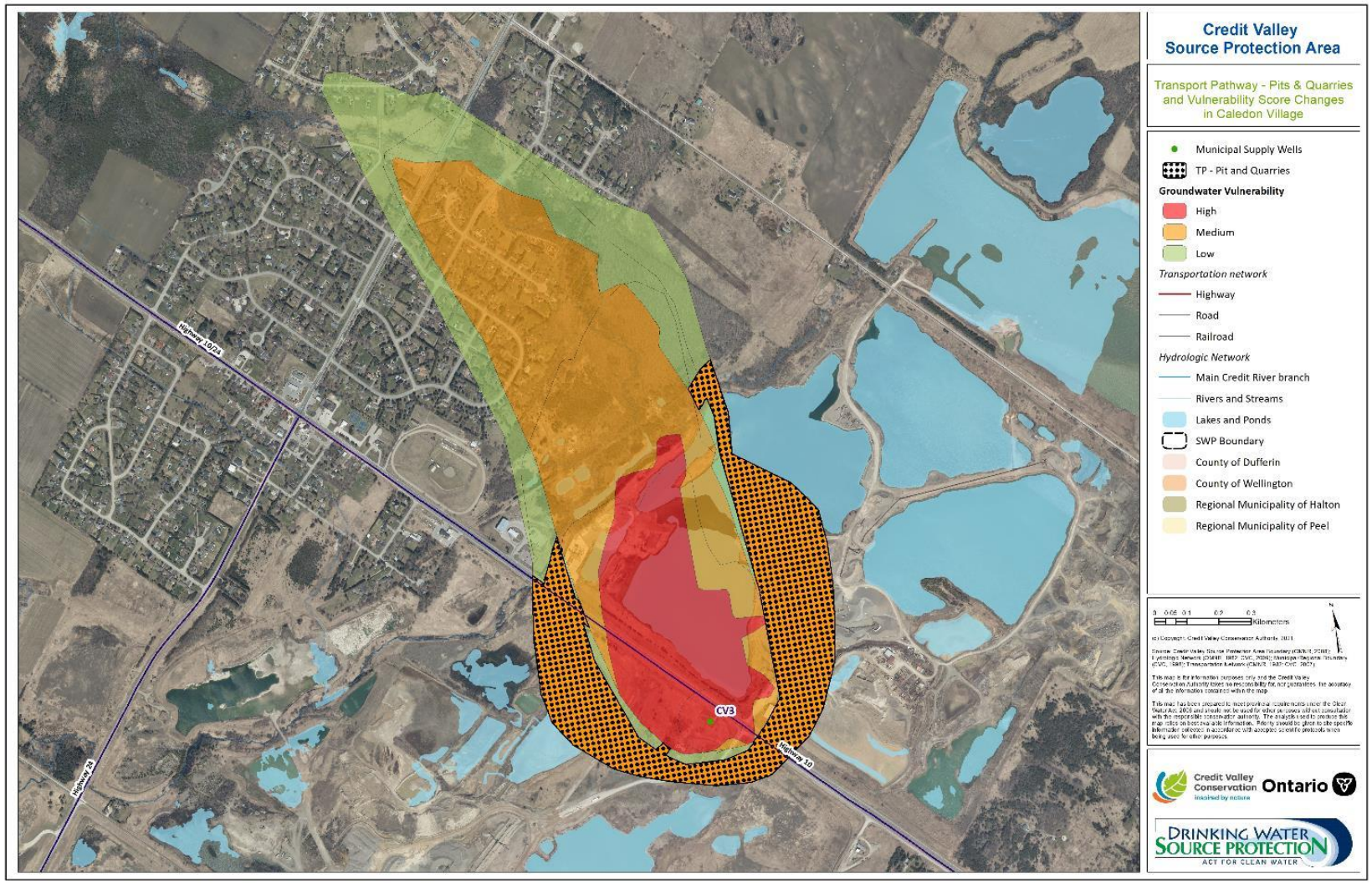


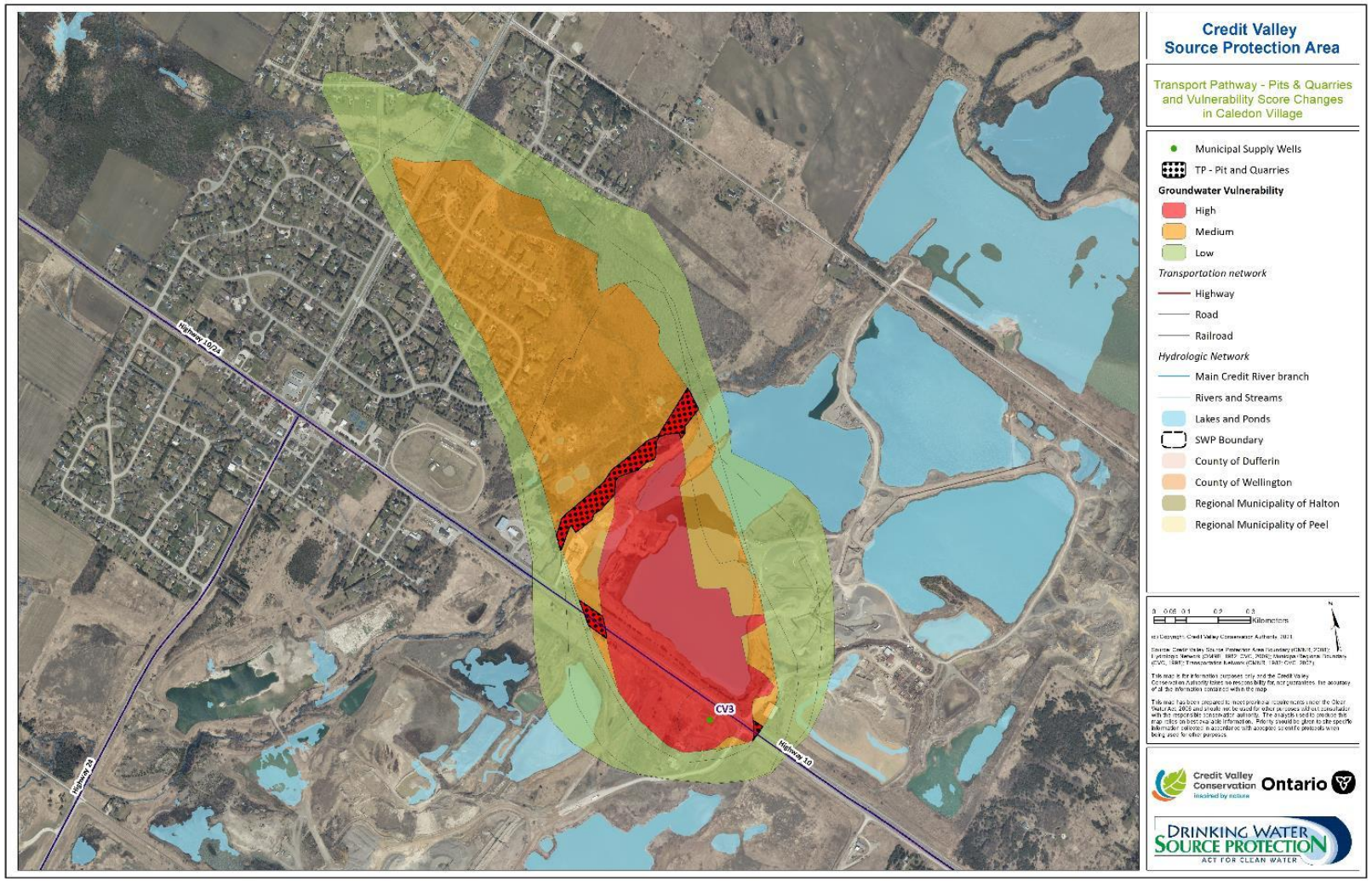
Figure 10: Transport Pathways related to aggregates: Alton; recommended change in vulnerability rating – low to medium

Figure 11: Transport Pathways related to aggregates: Caledon Village; recommended change in vulnerability rating – low to medium



** Peel Region recently re-delineated WHPA for CV 3, so this interpretation may be subject to review*

Figure 12: Transport Pathways related to aggregates: Caledon Village; recommended change in vulnerability rating – medium to high



** Peel Region recently re-delineated WHPA for CV 3, so this interpretation may be subject to review*

Figure 13: Transport Pathways related to SWM Ponds: Mono; recommended change in vulnerability rating – low to medium

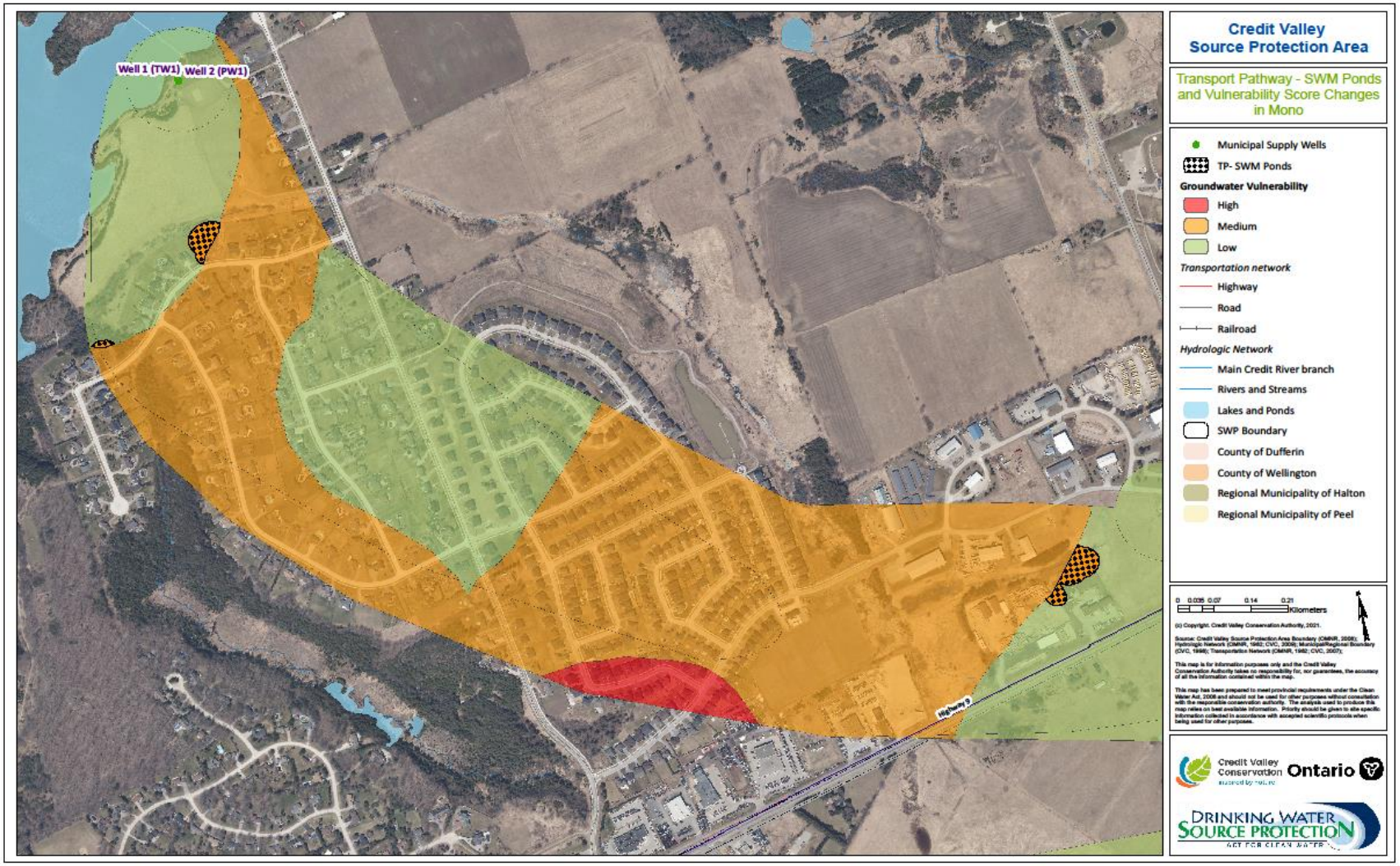


Figure 14: Transport Pathways related to SWM Ponds: Mono; recommended change in vulnerability rating – medium to high

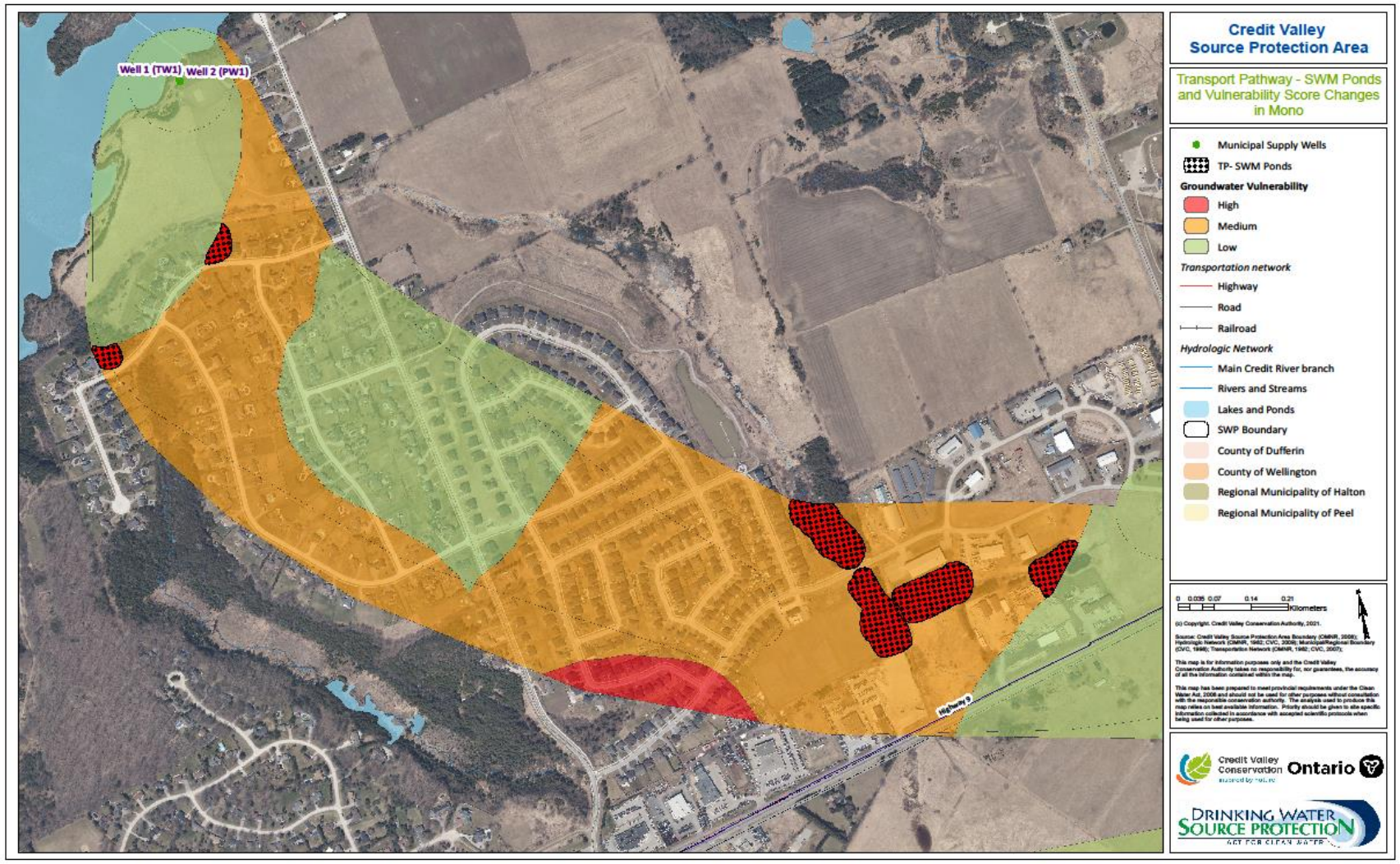


Figure 15: Transport Pathways related to SWM Ponds: Orangeville; recommended change in vulnerability rating – medium to high

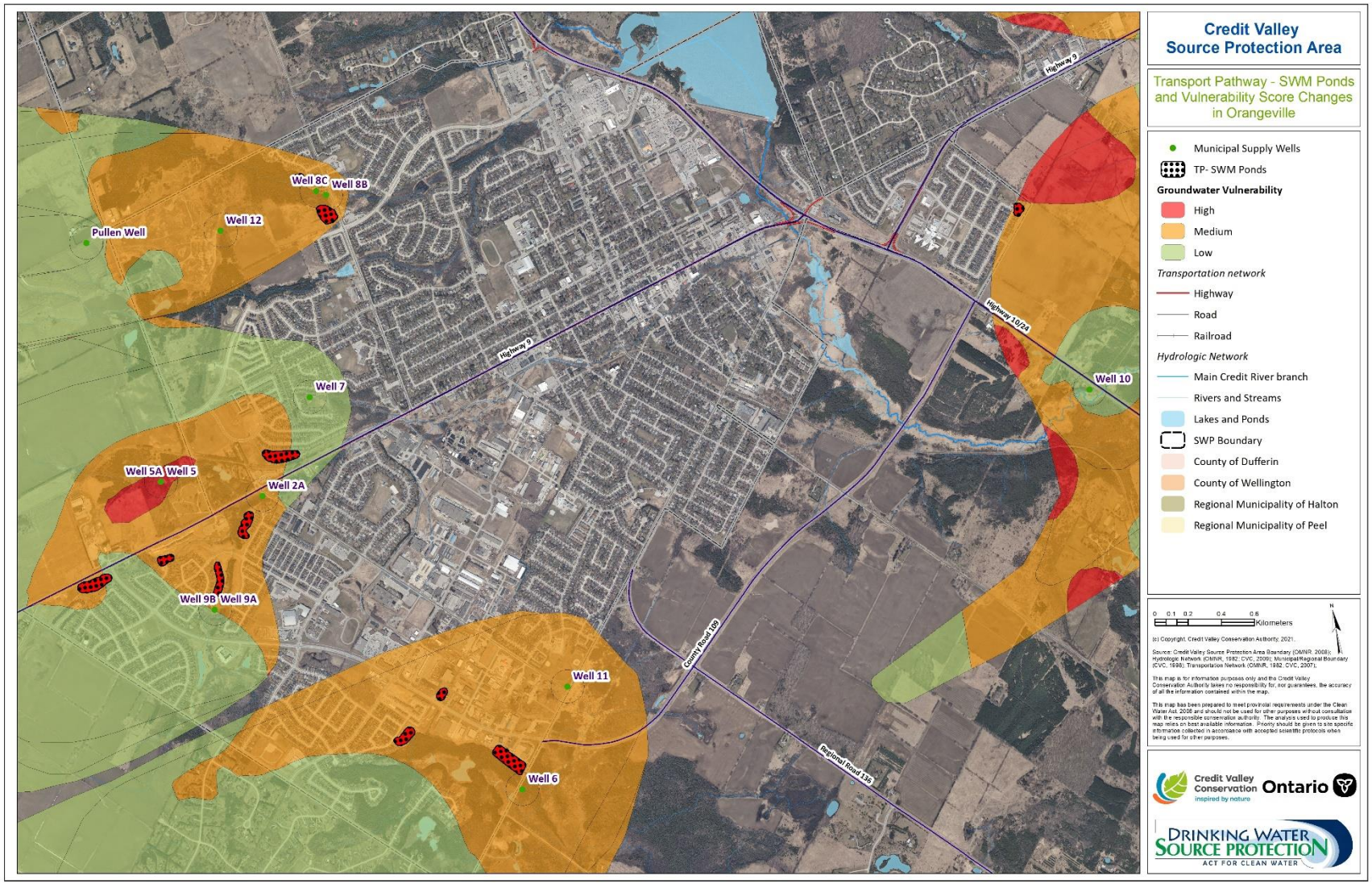


Figure 16: Transport Pathways related to Water Mains: Orangeville; recommended change in vulnerability rating – low to medium

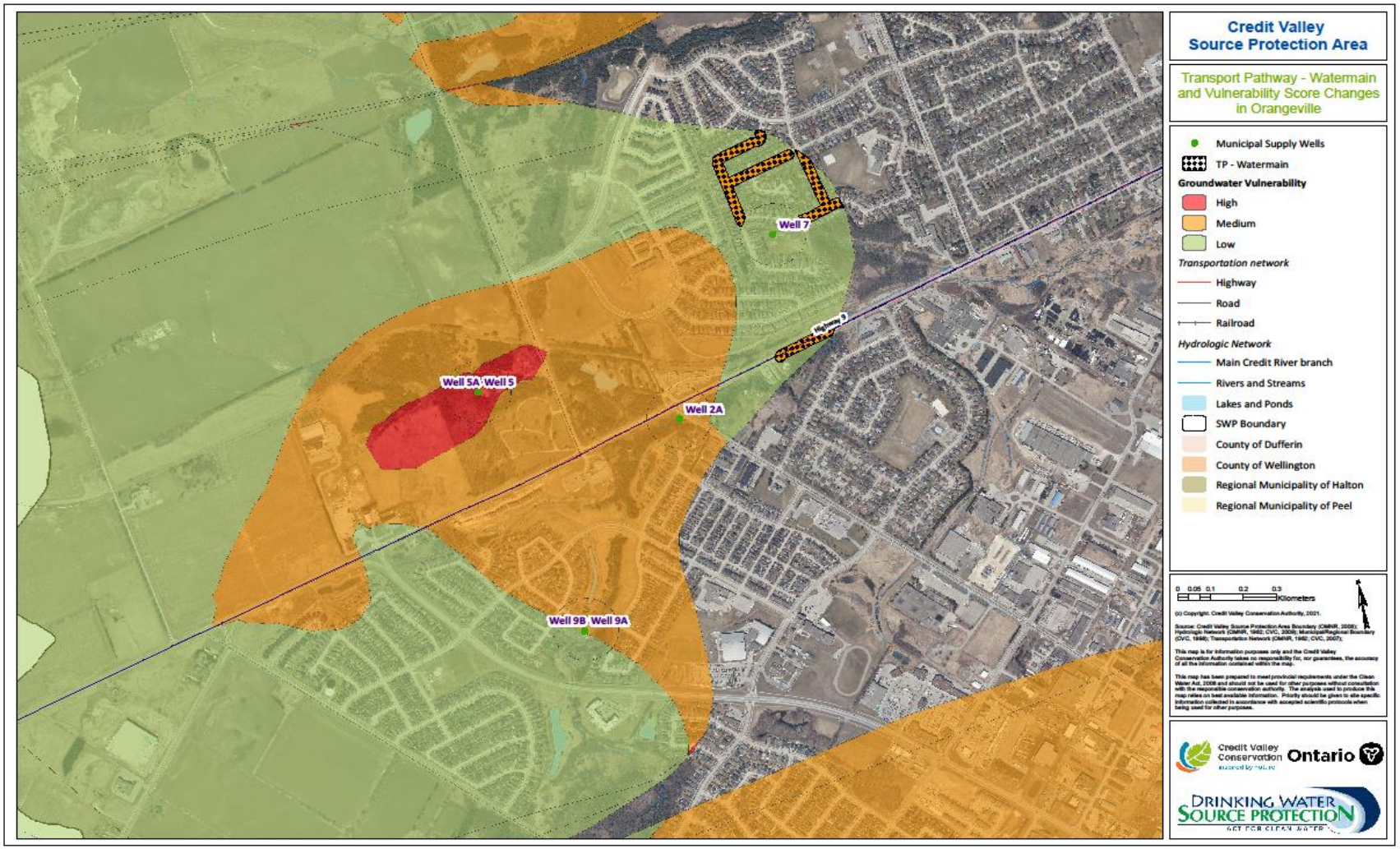


Figure 17: Transport Pathways related to Water Mains: Orangeville; recommended change in vulnerability rating – medium to high

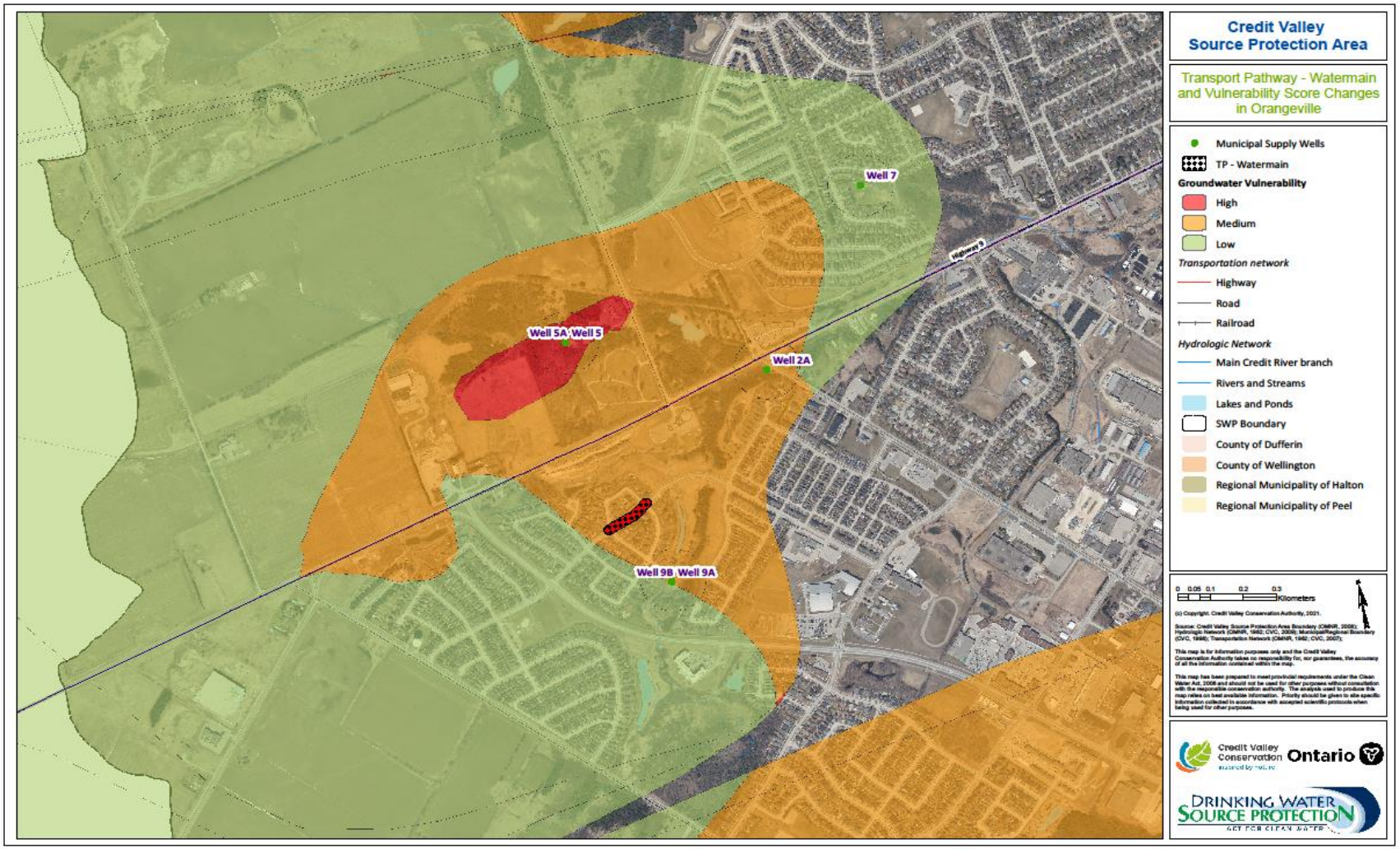
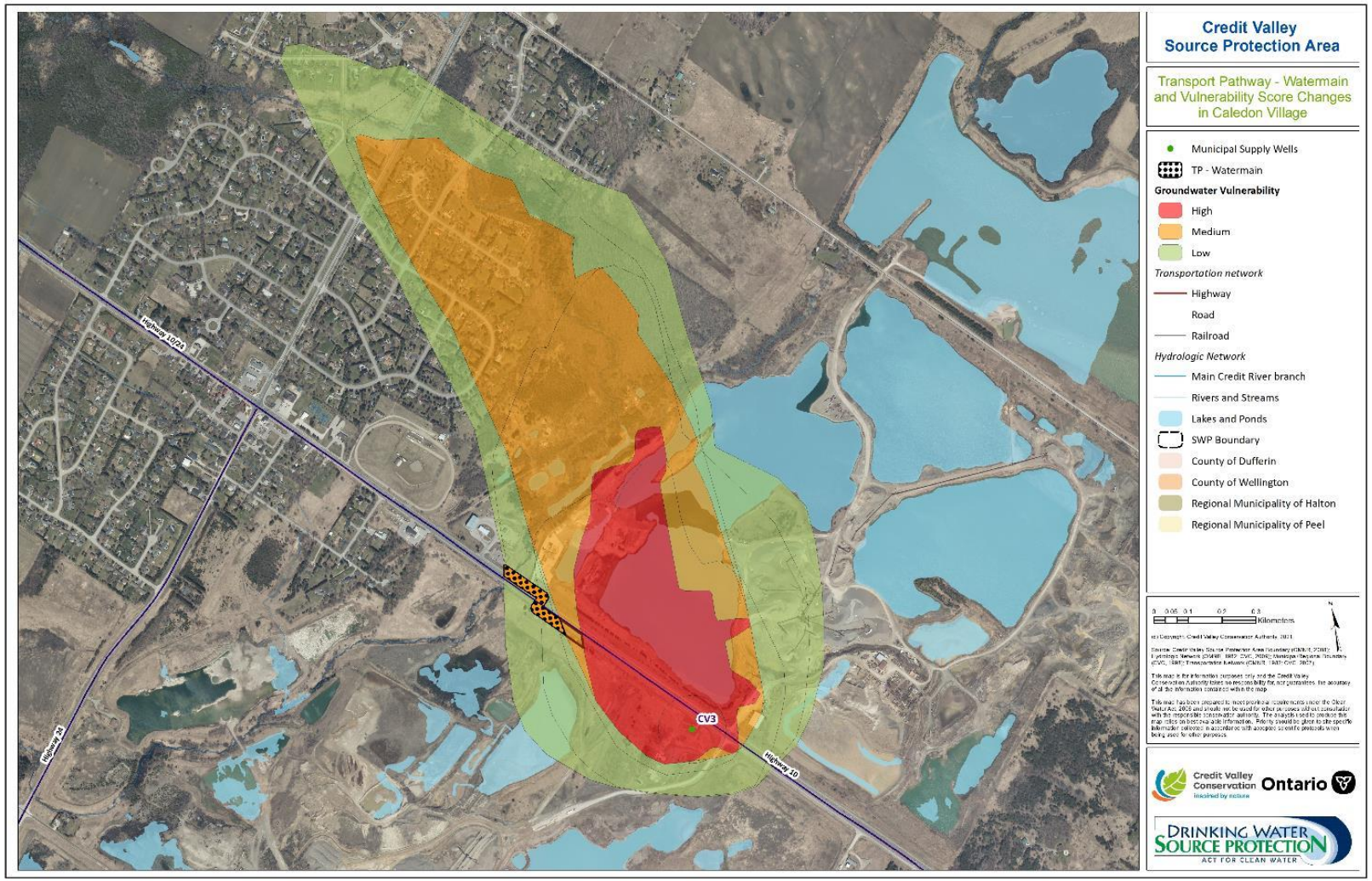
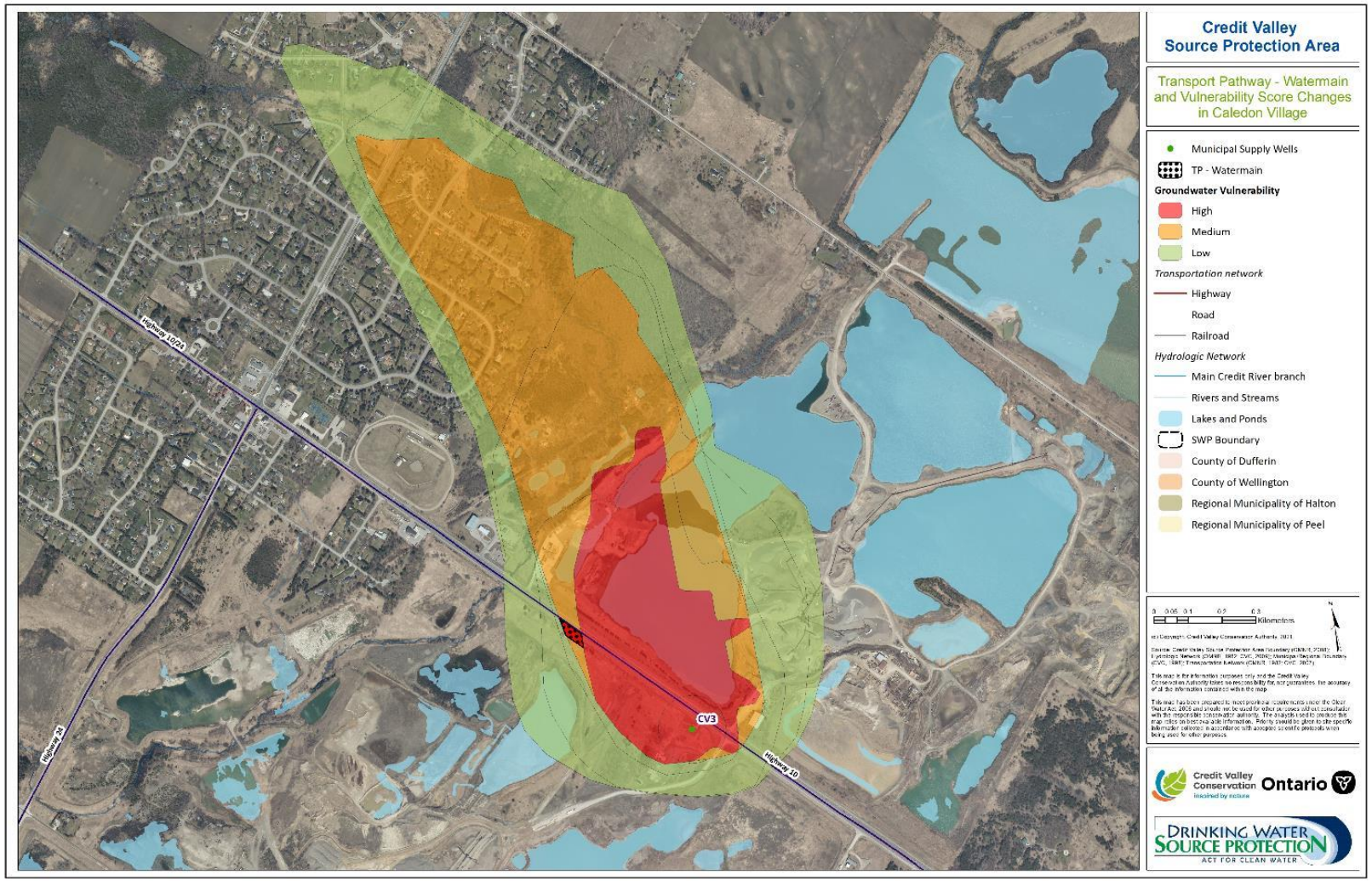


Figure 18: Transport Pathways related to Water Mains: Caledon Village; recommended change in vulnerability rating – low to medium



** Peel Region recently re-delineated WHPA for CV 3, so this interpretation may be subject to review*

Figure 19: Transport Pathways related to Water Mains: Caledon Village; recommended change in vulnerability rating – medium to high



** Peel Region recently re-delineated WHPA for CV 3, so this interpretation may be subject to review*

TO: Chair and Members of the CTC Source Protection Committee, Meeting #4/20

DATE: December 7, 2022

FROM: Behnam Doulatyari, Senior Manager, Watershed Plans and Source Water Protection

RE: Region of Peel – Palgrave, Caledon East, and Caledon Village – New Modelling

KEY ISSUE

Obtain direction from the SPC to incorporate the new technical work for an upcoming Section 34 amendment for an allocation increase at Palgrave Well 4, a delineation of a WHPA for a new Caledon East Well 6, and a delineation of a WHPA for an existing Caledon Village Well 3B.

RECOMMENDATION

IT IS RECOMMENDED THAT the CTC SPC endorse incorporation of the technical work completed at Palgrave, Caledon East, and Caledon Village into the Approved Toronto and Region Assessment Report, Approved Credit Valley Assessment Report, and the CTC Source Protection Plan

AND THAT staff be directed to take the necessary actions to proceed with the mandated 35-day consultation period when making amendments to Source Protection Plans.

BACKGROUND

Regional Municipality of Peel retained Aqua Insight Inc. to conduct a groundwater vulnerability assessment for municipal wells located in Palgrave, Caledon East, and Caledon Village. The assessment included the application of the model to delineate wellhead protection areas (WHPAs), the evaluation of the aquifer vulnerability, and the calculation of threats within the newly delineated WHPAs. The technical work was completed under the 2021 Director's Technical Rules. **Figure 8** provides an overview of the geographic context for the two systems.

Palgrave-Caledon East Drinking Water System Overview

The Palgrave-Caledon East Drinking Water System currently sources its water from three groundwater supply wells in Palgrave and three wells in Caledon East. The Drinking Water System is located in the headwaters of the Humber Watershed within the Toronto and Region Source Protection Area and services residents in the communities of Palgrave, Palgrave Estates, Caledon East, Mono Road, Albion, Centreville, and Cedar Mills. The Caledon East Well 6 is new, and the Wellhead Protection Area is being delineated for the first time.

Caledon Village - Alton Drinking Water System Overview

The Caledon Village Drinking Water System currently sources its water from three groundwater supply wells. The Drinking Water System is located within the headwaters of the Credit Valley

Source Protection Area and services residents in the community of Caledon Village. The Caledon Village Well 3B has been operating since 2014, but the Wellhead Protection Area is being delineated for the first time.

Section 34 Amendments

Wellhead Protection Areas (WHPAs)

Palgrave-Caledon East WHPA Delineation Changes

The Regional Municipality of Peel has completed the needed technical studies to support amendments to the Toronto and Region Source Protection Area Assessment Report. **Figure 9** shows the changes to the Palgrave Wellhead Protection Areas and **Figure 11** shows the changes to the Caledon East Wellhead Protection Areas.

The rationale for changes in delineation are as follows:

- The current model interpreted the Thorncliffe as thinner, than previously interpreted.
- The current model represents the Oak Ridges Silts, whereas the previous did not.
- The current model applied a higher hydraulic conductivity value for Palgrave Well 4.
- The current model incorporates the decommissioning of Caledon East Well 2.
- The current model incorporates the inclusion of Caledon East Well 6.
- The current model uses a wider set of model parameters.

Caledon Village WHPA Delineation Changes

The Regional Municipality of Peel has completed the needed technical studies to support amendments to the Toronto and Region Source Protection Area Assessment Report. **Figure 13** shows the changes to the Caledon Village Wellhead Protection Areas.

The rationale for changes in delineation are as follows:

- The current model represents the Oak Ridges Silts, whereas the previous did not.
- The current model uses a wider set of model parameters.

Vulnerability Scoring

Caledon East Transport Pathways

The presence of constructed or natural preferential pathways has the potential to increase the vulnerability of an aquifer as they allow surficial sources of contamination to move quickly form the ground surface to underlying aquifers. The Ministry of Environment, Conservation and Parks permits the vulnerability rating to be increased from medium to high or low to medium (or high) in areas where preferential pathways are present. Aqua Insight Inc. utilizing the pilot project methodology outlined by Credit Valley Conservation staff and the GIS layers provided the Regional Municipality of Peel in their transport pathways assessment. **Figure 10** and **Figure 12** show where vulnerability rating categories were increased.

The rationale for changes in vulnerability scoring are as follows:

- Watermains on Mount Hope Road near Palgrave Well 2.
- Closed private landfill southeast of Palgrave Well 2.

- Closed public landfill east of Palgrave Well 2.
- Sanitary, storm and watermains near Caledon East Well 3.
- Closed landfill Northwest of Caledon East Well 3.

Caledon Village Transport Pathways

The presence of constructed or natural preferential pathways has the potential to increase the vulnerability of an aquifer as they allow surficial sources of contamination to move quickly form the ground surface to underlying aquifers. The Ministry of Environment, Conservation and Parks permits the vulnerability rating to be increased from medium to high or low to medium (or high) in areas where preferential pathways are present. Aqua Insight Inc. utilizing the pilot project methodology outlined by Credit Valley Conservation staff and the GIS layers provided the Regional Municipality of Peel in their transport pathways assessment **Figure 14** shows where vulnerability rating categories were increased.

The rationale for changes in vulnerability scoring are as follows:

- Sanitary, storm and watermains near Caledon Village Wells 3/3B and Caledon Village Well 4.
- Existing and closed aggregate extraction operations near Caledon Village Wells 3/3B and Caledon Village Well 4.
- Closed landfill northwest of Caledon Village Well 4.

Section 48 Notice

Under section 2(3) of O. Reg. 205/18, an application for an amendment to a drinking water works permit, must be accompanied by a copy of a Notice described in Clause 48 (1.1) (b) of O. Reg. 287/07. This notice contains a summary or proposed changes and indicates the Source Protection Authority has confirmed all material necessary to update the CTC Source Protection Plan have been provided. It should be noted that some wells in the Palgrave-Caledon East Drinking Water System straddle the boundaries of Toronto and Region Source Protection Area (TRSPA), and Nottawasaga Valley Source Protection Area (NVSPA), while the Caledon Village – Alton system is in Credit Valley Source Protection Area (CVSPA). A draft of the Section 48 Notice to be issued jointly by Source Protection Authorities in Dec 2023 has been provided in Appendix A.

DETAILS OF WORK TO BE DONE

Staff from the CTC, TRCA, and CVC have identified the required amendments to the CTC Source Protection Plan, Toronto and Region Assessment Report and Credit Valley Assessment Report and will continue to update the CTC SPC regarding the progress of these Section 34 amendments.

Report prepared by:

Kristina Anderson, Senior Hydrogeologist, Toronto and Region Conservation Authority
Tel: 437-800-2376
Email: kristina.anderson@trca.ca

Date: November 28, 2022

Attachments (8):
Figure 1 Regional Study Area
Figure 2 Proposed Palgrave WHPAs
Figure 3 Proposed Palgrave Vulnerability Scores including Transport Pathways
Figure 4 Proposed Caledon East WHPAs
Figure 5 Proposed Caledon East Vulnerability Scores Including Transport Pathways
Figure 6 Proposed Caledon Village WHPAs
Figure 7 Proposed Caledon East Vulnerability Scores Including Transport Pathways
Appendix A: Draft Section 48 Notice

ATTACHMENT 1

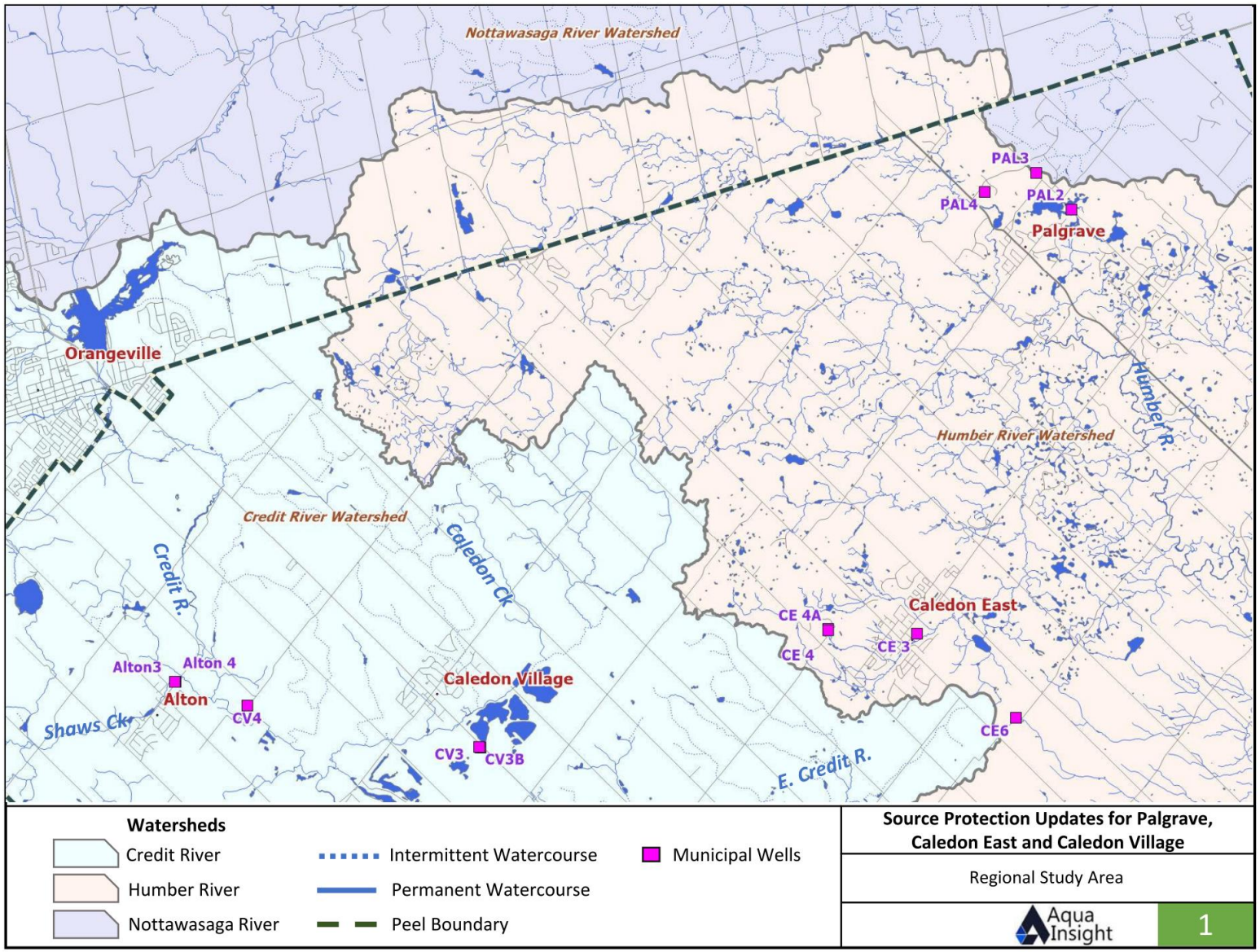


FIGURE 8 REGIONAL STUDY AREA (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

ATTACHMENT 2

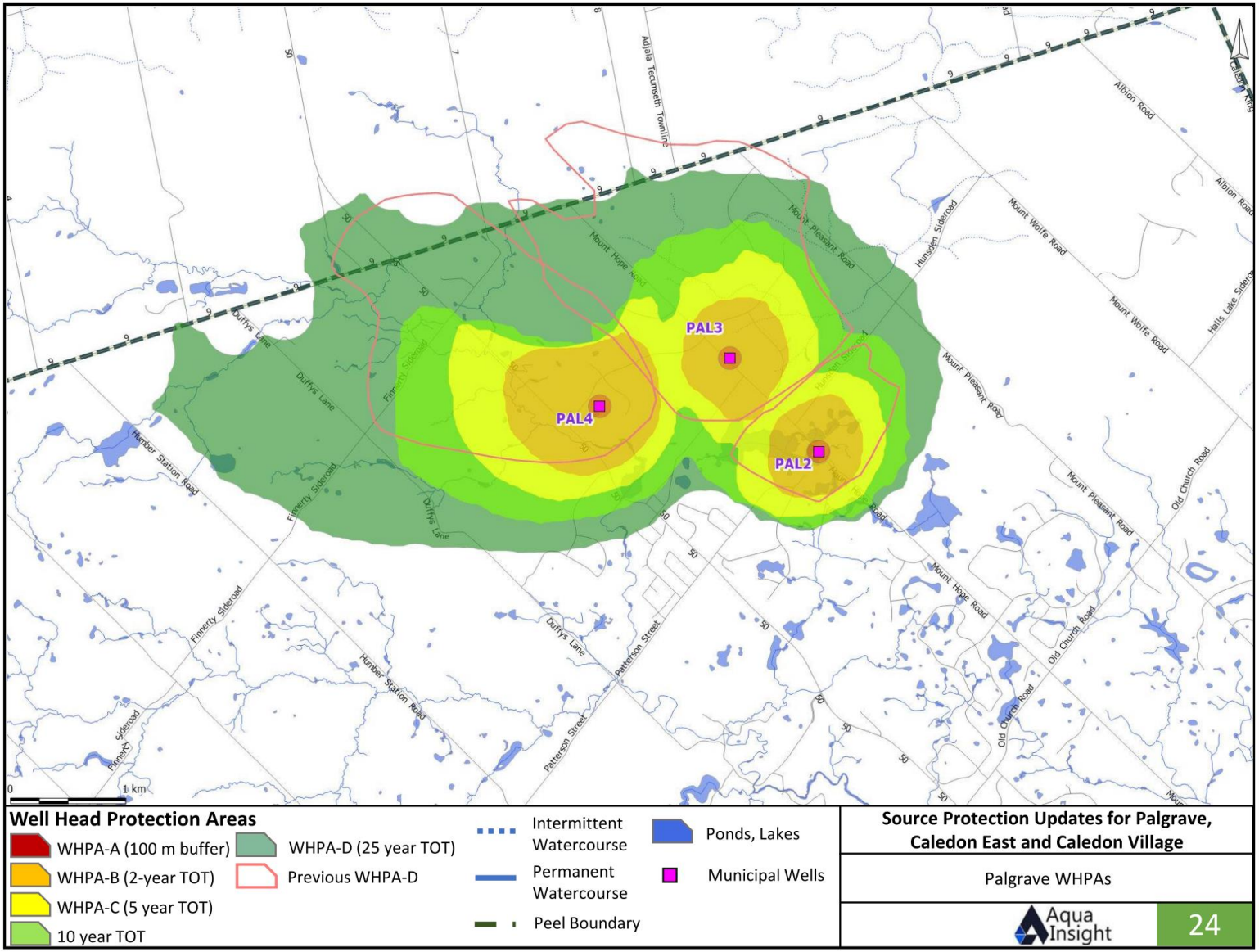


FIGURE 9 PROPOSED PALGRAVE WHPAS (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

ATTACHMENT 3

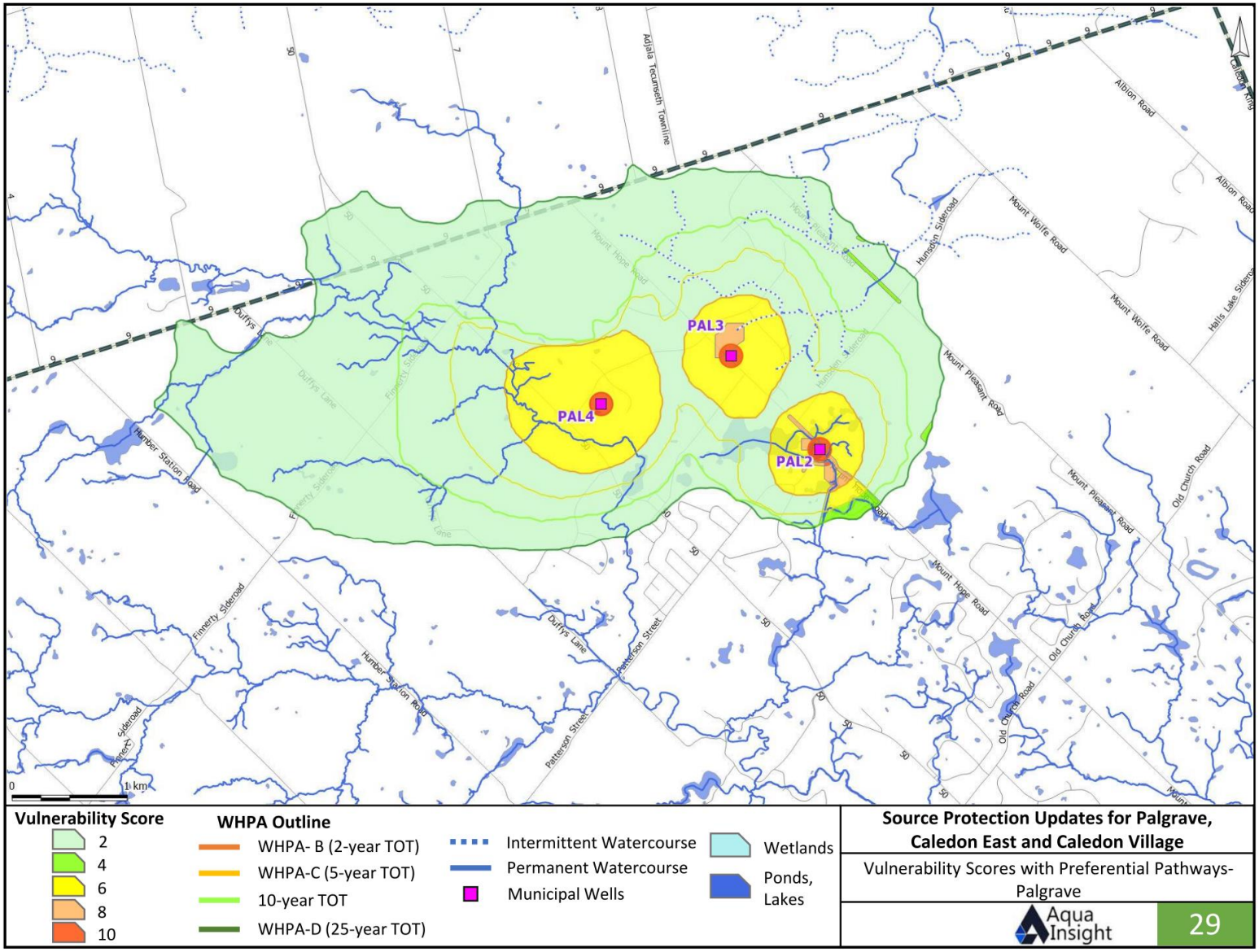


FIGURE 10 PROPOSED PALGRAVE VULNERABILITY SCORES INCLUDING TRANSPORT PATHWAYS (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

ATTACHMENT 4

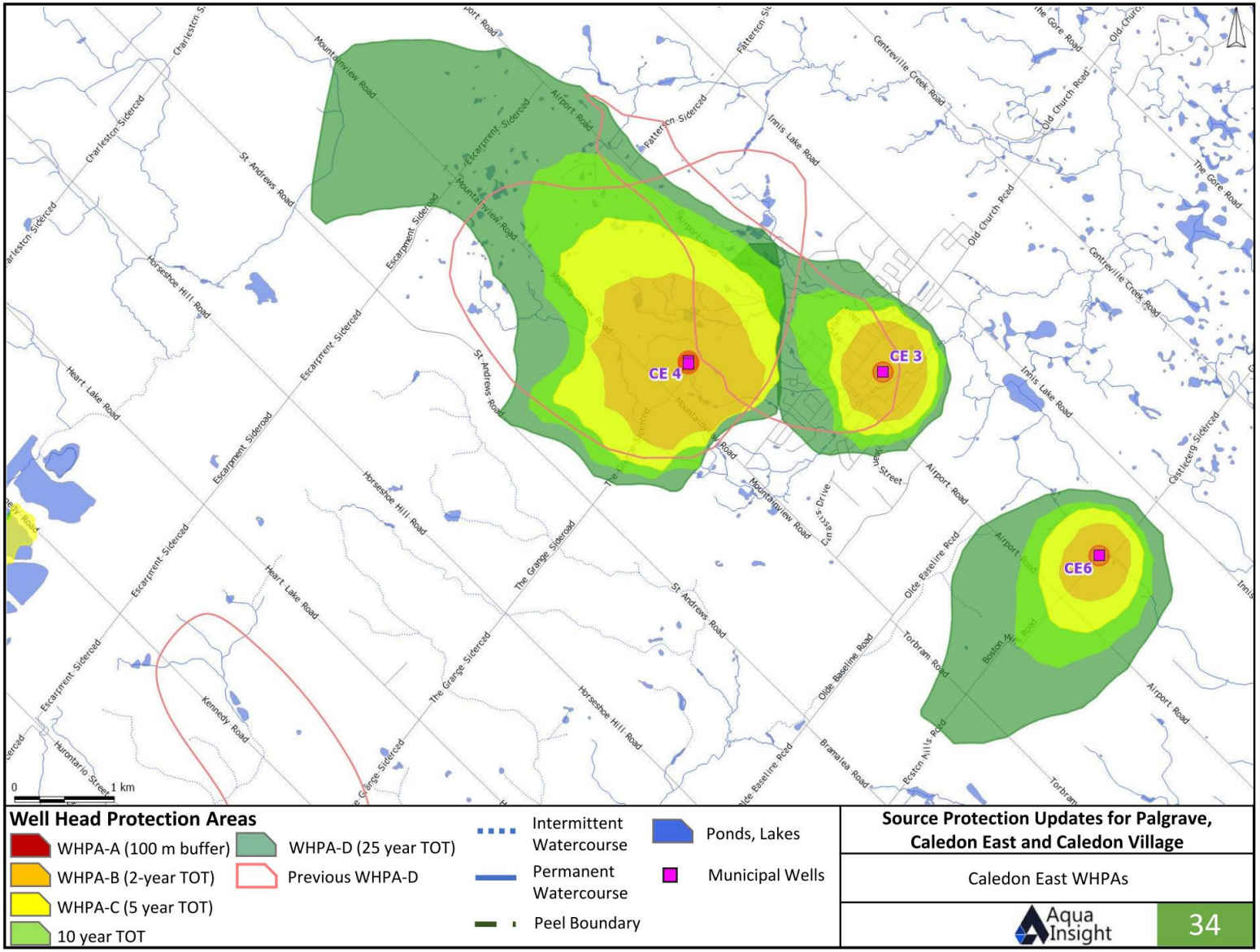


FIGURE 11 PROPOSED CALEDON EAST WHPAS (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

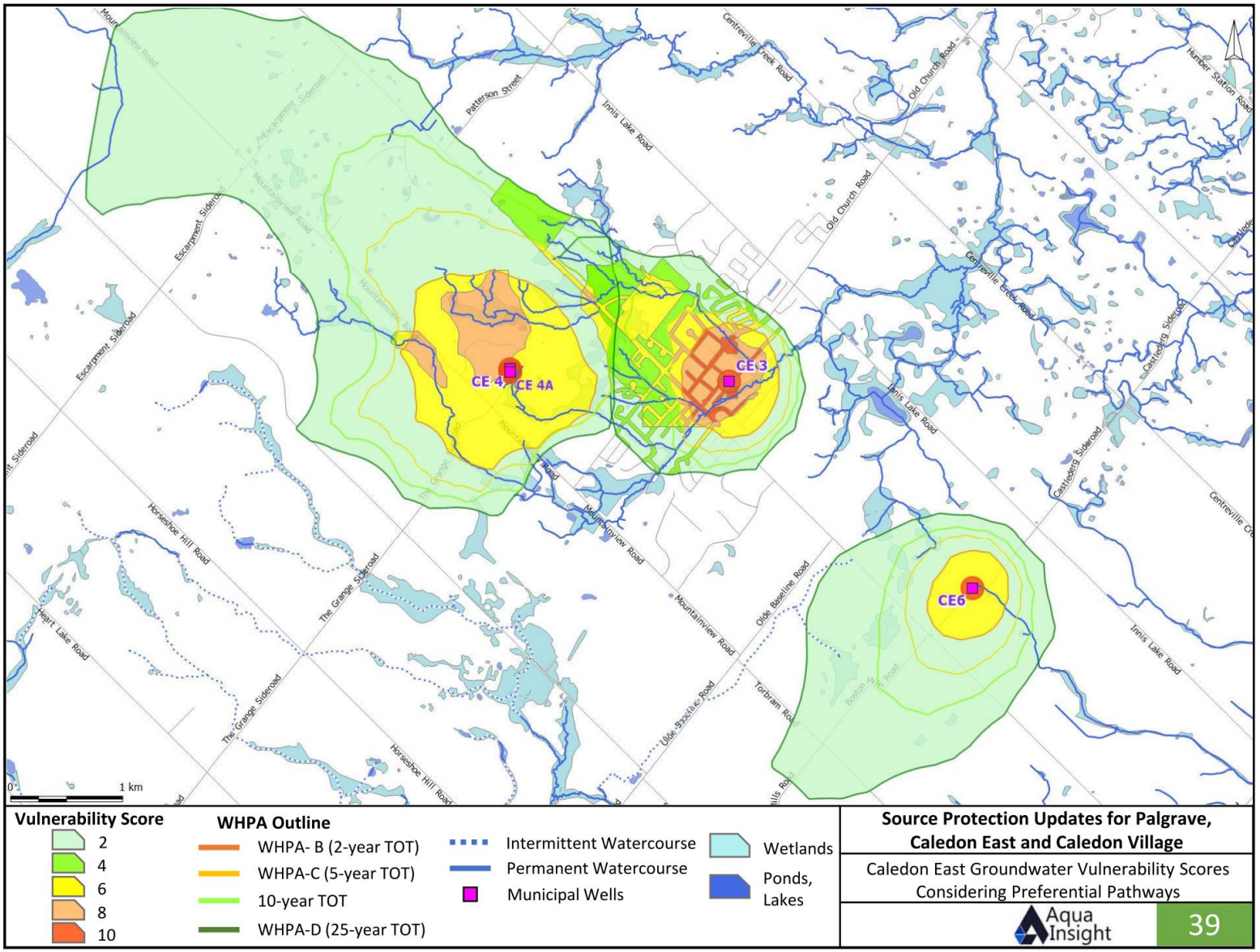


FIGURE 12 PROPOSED CALEDON EAST VULNERABILITY SCORES INCLUDING TRANSPORT PATHWAYS (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

ATTACHMENT 6

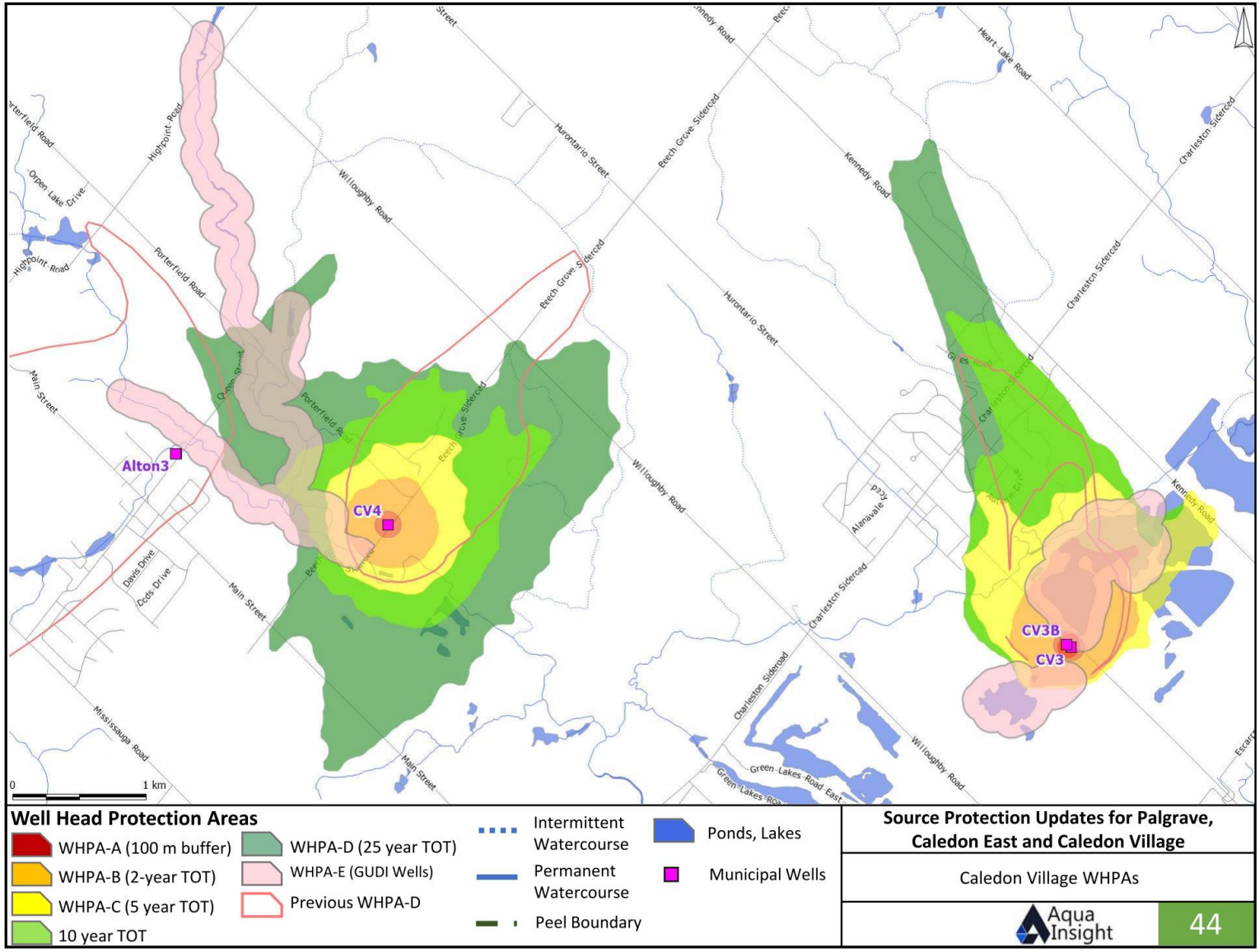


FIGURE 13 PROPOSED CALEDON VILLAGE WHPAS (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

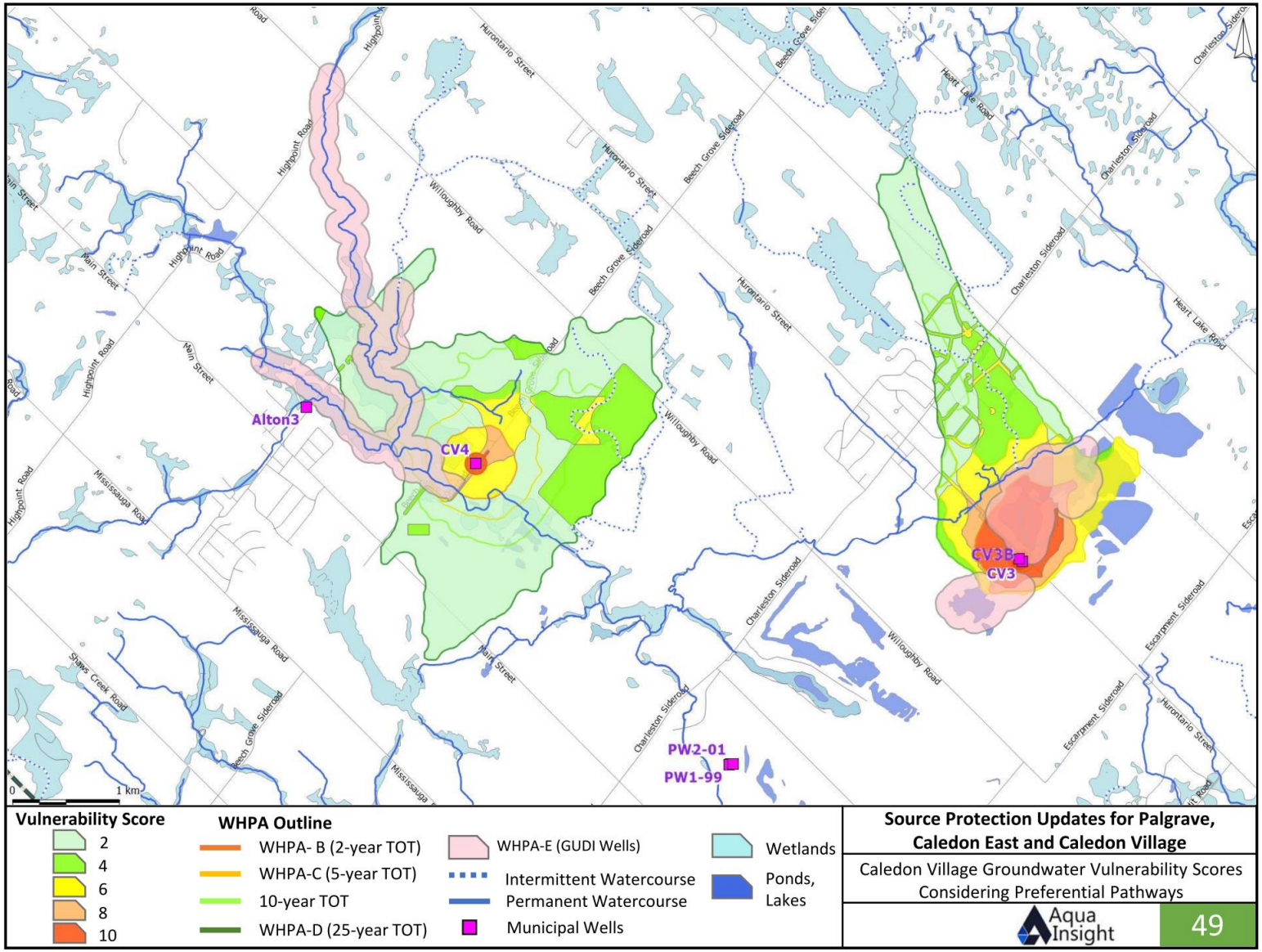


FIGURE 14 PROPOSED CALEDON EAST VULNERABILITY SCORES INCLUDING TRANSPORT PATHWAYS (FROM AQUA INSIGHT INC. 2022 SOURCE PROTECTION UPDATES FOR THE COMMUNITIES OF PALGRAVE, CALEDON EAST, AND CALEDON VILLAGE)

Appendix A: Draft Section 48 Notice

NOTICE OF AMENDMENTS TO SOURCE PROTECTION PLAN

(pursuant to section 48(1.1)(b) of Ontario Regulation 287/07)

***Existing* or Planned Municipal Drinking Water System (System):**

Palgrave - Caledon East Drinking Water System (Drinking Water Works Number: 220003993)

Caledon Village - Alton Drinking Water System (Drinking Water Works Number: 220004000)

Name of Owner of Existing or Planned Municipal Drinking Water System (Owner):

Regional Municipality of Peel

Applicable Source Protection Area (Source Protection Area):

Toronto and Region Source Protection Area (TRSPA); Credit Valley Source Protection Area (CVSPA); Nottawasaga Valley Source Protection Area (NVSPA)

The **Toronto and Region Source Protection Authority, Credit Valley Source Protection Authority,** and the **Nottawasaga Valley Source Protection Authority** are the Source Protection Authorities for the Source Protection Areas.

The **Toronto and Region Source Protection Authority, Credit Valley Source Protection Authority,** and the **Nottawasaga Valley Conservation Authority** have received written notice from the Owner about an intended application under the *Safe Drinking Water Act, 2002* for an existing or planned System that is located within the Source Protection Area.

The **Toronto and Region Source Protection Authority, Credit Valley Source Protection Authority,** and the **Nottawasaga Valley Conservation Authority** are satisfied* that the technical work required pursuant to subsection 48(1.1) of Ontario Regulation 287/07 under the *Clean Water Act, 2006* is completed for the purposes of identifying anticipated amendments to the source protection plan for the Source Protection Area.

The **Toronto and Region Source Protection Authority, Credit Valley Source Protection Authority,** and the **Nottawasaga Valley Conservation Authority** anticipate the amendments set out in Schedules A (TRSPA) and B (NVSPA) of this notice will be required as a result of the intended application. The list of anticipated amendments in Schedules A and B are provisional and will undergo consultations with stakeholders and the source protection committee. All amendments must be approved by the Ministry of the Environment, Conservation and Parks and are subject to change after this Notice is issued. The timing for approval of the amendments by the Ministry of Environment, Conservation and Parks is not within the control of the Source Protection Authority. The Schedule A also indicates amendments that have been completed.

All actions by **Toronto and Region Source Protection Authority, Credit Valley Source Protection Authority,** and the **Nottawasaga Valley Conservation Authority** for the purposes of this Notice are undertaken as the Source Protection Authority for the above noted Source Protection Area and are subject to the *Clean Water Act, 2006*. This Notice does not exempt the Owner from obtaining the required licence or permit to operate the System under the *Safe Drinking Water Act, 2002.*

Issued by: _____ **Date:** _____

Issued by: _____ **Date:** _____

Issued by: _____ **Date:** _____

* ***Satisfied*** should be interpreted that the materials needed to update the CTC and SGBLS Source Protection Plans have been received by Toronto and Region Source Protection Authority, Credit Valley Source Protection Region, and Nottawasaga Valley Conservation Authority. Toronto and Region Source Protection Authority, Credit Valley Source Protection Region, and Nottawasaga Valley Source Protection Authority has not reviewed the technical data for conformity with the *Director's Technical Rules.*

Schedule A – Summary of Anticipated Amendments to the CTC Source Protection Plan for updated Wellhead Protection Areas in Peel
Peel Region – s 34 for Palgrave, Caledon East, Caledon Village

Scope of Work:

1. Source water work to support two Class EAs:
    - new supplementary source of supply referred to as Caledon East Well #6,
    - Supply capacity increase for Palgrave Well #4
2. Updated PWRMM19 MODFLOW model; PWRMM21FEFLOW model
3. Delineation of wellhead protection areas (A, B, C, D, E, and C1, where applicable), per 2021 Director's Technical Rules (DTR), for:
    - Palgrave existing wells 2, 3, and 4 (capacity increase)
    - Caledon East existing wells 3, 4, 4A; and new well 6
    - Caledon Village existing wells 3, 4; and "new" well 3B (in service since 2014 but not yet included in SPP)
4. Aquifer vulnerability assessment, transport pathways assessment, and vulnerability scoring, per 2021 DTR and CTC Transport Pathways methodology (draft)
5. Managed lands, livestock density, percent imperviousness mapping, per 2021 DTR
6. Threats enumeration per 2021 Director's Technical Rules

No.	Section or Figure	Brief Description of Anticipated Amendment	Estimated Timing to Submit Proposed Amendment to Ministry of the Environment, Conservation, and Parks
Toronto and Region Assessment Report			
1.	Preface	Update map to include the new production Well 6 in Caledon East.	September 2023
2.	Chapter 2	Update text, maps and tables to reflect the new production Well 6 in Caledon East	September 2023
3.	Chapter 4	Update text, maps and tables to reflect the new production Well 6 in Caledon East and capacity increases for Palgrave well 4. Includes updated Wellhead Protection Area (WHPA) delineation, scoring, and mapping as well as updated transport pathways methodology and assessment	September 2023
4.	Chapter 5	Update text, maps and tables to reflect the new production Well 6 in Caledon East and capacity increases for Palgrave well 4. Includes updated Wellhead Protection Area (WHPA) delineation, scoring, and mapping.	September 2023
5.	Chapter 7	Update Bibliography to include new reference to Peel's foundation reports for the new well 6 in Caledon East, updated modelling, and threats enumeration.	September 2023
6.	Appendices	Update appropriate figures and text to include new well 6 in Caledon East and references to the foundation documents.	September 2023

CTC Source Protection Plan			
1.	Figure 2-2	Update map of CTC SPR (WHPAs)	September 2023
2.	s.2.1	Number of active supply wells update	September 2023
3.	s.5.1.10	Discussion of consultation of amendments	September 2023
4.	Table 6-1	Update well counts for Caledon East, Caledon Village	September 2023
5.	s.7.2	Update to transport pathways description	September 2023
6.	s.8.3	Summarize amendments made	September 2023
7.	Maps 1.8, 1.11, 1.12	Update significant groundwater quality threat areas (WHPAs, vulnerability scores)	September 2023
8.	Maps 2.8, 2.11, 2. 12	Update significant DNAPL threat areas (WHPAs)	September 2023
9.	S.4.1.2	Include description of updates to assessment reports	September 2023
10.	S.5.1	Include description of consultation on amendments	September 2023
11.	Map 3.5	Update WHPAs in WHPA-Q Downgradient Line map	September 2023
CTC Explanatory Document			

Schedule B – Summary of Anticipated Amendments to the Nottawasaga Valley and Credit Valley Assessment Reports

for updated Wellhead Protection Areas in Peel

No.	Section or Figure	Brief Description of Anticipated Amendment	Estimated Timing to Submit Proposed Amendment to Ministry of the Environment, Conservation, and Parks
Nottawasaga Valley Assessment Report			
1	Chapter 7	Update text, maps, and tables to reflect the new production Well 6 in Caledon East and capacity increases for Palgrave well 4. Includes updated Wellhead Protection Area (WHPA) delineation, scoring, and mapping.	September 2023
CVC Assessment Report			
1	Executive Summary	Update text to account for the updated significant drinking water quality threats count. Update map to include new WHPA delineation for Caledon Village Well 3, 3B, and 4.	September 2023
2	Chapter 2	Update text and tables to reflect changes in maximum annual pump rate of the Caledon Village wellfield. Update text to include technical specifications of Caledon Village Well 3B	September 2023
3	Chapter 4	Update text, maps, and tables to reflect changes in the delineation of the WHPAs, vulnerability scores, and transport pathways areas of influence of the Caledon Village wellfield (Well 3, 3B, and 4). Amendments to the text speaking to the transport pathways methodology adopted in the CV SPA. Update text to reflect refinements made to the groundwater flow model applied to the Caledon Village wellfield (Well 3, 3B, and 4).	September 2023
4	Chapter 5	Update text to include the methodology for calculating the percent impervious area for the Caledon Village wellfield (Well 3, 3B, and 4) using the Director Technical Rules 2021. Update text and tables which summarize the total number of significant drinking water threats and the number of parcels with significant drinking water threats. Update maps to include new areas of chemical, pathogen, and DNAPL threats for Caledon Village Well 3, 3B. and 4.	September 2023
5	Chapter 6	Update text speaking to the transport pathways methodology adopted in the CV SPA. Update text and tables to account for changes in the number of significant drinking water quality and quantity threats and the total number of parcels with significant drinking water threats.	September 2023
6	Chapter 7	Update References section with the recent foundation report completed by Aqua Insight Inc. (2022) which details the technical study performed to update modelling, WHPA delineation and threats enumeration for the Caledon Village wellfield.	September 2023
7	Appendices	Update appropriate figures and text to include technical information presented in the recent foundation report completed by Aqua Insight Inc. (2022) which details the technical study performed to update modelling, WHPA delineation, threats enumeration, and transport pathways areas of influence for the Caledon Village wellfield (Well 3, 3B, and 4).	September 2023

TO: Chair and Members of the CTC Source Protection Committee, Meeting #4/22

DATE: Dec 7, 2022

FROM: Don Ford, Senior Manager, Hydrogeology and Source Water Protection, Toronto and Region Conservation Authority

RE: **The New Toronto Island Water Treatment Plant Intake and New Ashbridges Bay Treatment Plant Outfall**

KEY ISSUE

Obtain direction from the SPC to incorporate the new technical work for the new Toronto Island Water Treatment Plant Intake and Ashbridges Bay Treatment Plant Outfall into the Approved Toronto and Region Assessment Report and CTC Source Protection Plan.

RECOMMENDATION

IT IS RECOMMENDED THAT the CTC SPC receive the technical work completed for the new Toronto Island Water Treatment Plant intake and the new Ashbridges Bay Treatment Plant outfall for incorporation into the Approved Toronto and Region Valley Assessment Report and the CTC Source Protection Plan;

AND THAT staff be directed to take the necessary actions to proceed with the mandated pre-consultation with impacted stakeholders and 35-day public consultation required when making amendments to Source Protection Plans;

BACKGROUND

In response to increased demand for lake-water cooling of downtown office towers, a private entity, ENWAVE, is retrofitting one of the former shallow intakes for the Toronto Island Water Treatment Plant. As can be seen on **Figures 1 and 2**, the new intake will be about halfway between the decommissioned shallow intake location and the three deep-water intakes mapped in the TRSPA Assessment Report. Although the three deep-water intakes are sufficient to meet the City's potable water needs, ENWAVE is installing infrastructure that will allow the City to utilize water from this new intake on an as-needed basis. Under most conditions, the fourth intake will supply the new cooling system, but when needed, the piping configuration will allow water drawn through the fourth intake to supply raw water to the Island Water Treatment Plant. The City proposes to designate this new intake as New Intake #4.

The Municipal Class Environmental Assessment for the new Intake 4 was initiated in January 2020 and the Notice of Completion was issued on Sept 11, 2020. Construction began in late 2020, and is anticipated to be complete by early 2024, with commissioning and initiating the water supply anticipated in May 2024. Bill Snodgrass from the City of Toronto presented the technical details of this work to the CTC Source Protection Committee in November 2020.

The TRSPA Assessment Report must be updated to include this new intake. The City and ENWAVE have undertaken a focused lake modelling study (i) to develop the IPZ1 and IPZ

representation for the new intake, and (ii) using the event based method for developing an IPZ3 representation of a threat assessment, ascertain the potential water quality threats to this intake concurrently with threat assessments for the new Ashbridges Bay outfall. This modelling has demonstrated that both the new and existing Ashbridges Bay outfalls are a significant drinking water threat to New Intake #4. These changes will have to be reflected in an updated TRSPA Assessment Report and CTC Source Protection Plan (SPP).

The Ashbridges Bay Wastewater Treatment Plant is Toronto's largest wastewater treatment plant (and one of the largest in North America), with an outfall that is more than 70 years old. The City is undertaking a major infrastructure upgrade to create a new outfall with increased capacity and greater diffusion capability further from the lakeshore (note that the current intake will be maintained for emergency use). The existing outfall was assessed as not being a significant drinking water threat through the initial Lake Ontario lake-wide modelling work for the 2015 Assessment Report; updated modelling was required for the new Island intake, and existing and new ABTP outfall,as described below.

Section 34 Amendments

Toronto Island Intakes

The City of Toronto has completed the needed technical studies to support amendments to the Toronto and Region Source Protection Area Assessment Report. **Figure 2** shows the current two shallow and three deep Island WTP intakes and associated vulnerability scores, while **Figure 3** shows the Intake Proteciton Zones (IPZs). IPZ 1s are based on a 1 km radius from the intake; IPZ 2s are based on a 2-hour time of travel from the lake to the intake. The revised IPZ-3s (Event-based areas) required Section 34 amendments to the text and mapping of the Toronto and Region Source Protection Area Assessment Report are expected to include:

- Addition of IPZs 1 and 2 for the new fourth intake, and deletion of the existing IPZs 1, 2, and 3 for the east shallow intake that will be incorporated into the new intake; and
- Incorporation of technical results from IPZ 3 (modelled) evaluations related to the new fourth intake and for an anticipated new future location of the Ashbridges Bay Treatment Plant outfall that would affect all intakes. Construction of the new outfall has been initiated, with an anticipated completion date of late 2024/early 2025.

No changes are anticipated to the policies of the CTC Source Protection Plan (SPP), resulting from the new intake. However, changes will be required to mapping in the SPP to indicate the location of the new intake.

Ashbridges Bay Wastewater Treatment Plant

Disinfection failure associated with the existing Ashbridge Bay Treatment Plant outfall was modelled as part of the original Lake Ontario Collaborative work (2015 Assessment Report) and was found to be a significant threat to several potable water intakes. A focused lake modelling was conducted for this new ABTP outfall and the City of Toronto Island Water Treatment Plant potable water intakes. The results indicate that E*.Coli densities* for the new outfall are similar in magnitude to that of the existing outfall, and that the new outfall along with the existing outfall represent a significant drinking water threat to the Toronto Island intakes. In comparison to the previous study for the 2015 Assessment Report, the E*.Coli* density for the deep west (# 1) intake was below the 100 CFU/100 ml threshold for the existing outfall, and accordingly the existing outfall was not considered to be a significant drinking water threat to the three deep intakes in the 2015 Assessment Report. Based on these results, the TRSPA Assessment Report and the CTC

Source Protection Plan will have to be updated to reflect the addition of the Ashbridges Bay outfalls as a significant drinking water threat to the Toronto Island intakes. BBecause the focused modelling study results indicate that E.Coli densities from the new ABTP outfall for the Island Intakes are similar to those for the existing ABTP outfall, no changes are required at other Lake Ontario intakes. The proposed mapping showing the updated spill scenario results are shown on **Figure 4.**

Section 48 Notice

Under section 2(3) of O. Reg. 205/18, an application for an amendment to a drinking water works permit, must be accompanied by a copy of a Notice described in Clause 48 (1.1) (b) of O. Reg. 287/07. This notice contains a summary or proposed changes and indicates the Source Protection Authority has confirmed all material necessary to update the CTC Source Protection Plan have been provided. A draft of the Section 48 Notice to be issued by Toronto and Region Source Protection Authority in Dec 2023 has been provided in Appendix A.

DETAILS OF WORK TO BE DONE

Staff from the CTC, TRCA, and the City of Toronto have identified the required amendments to the Toronto and Region Assessment Report and the CTC Source Protection Plan and will continue to update the CTC SPC regarding the progress of these Section 34 amendments.

Report prepared by:

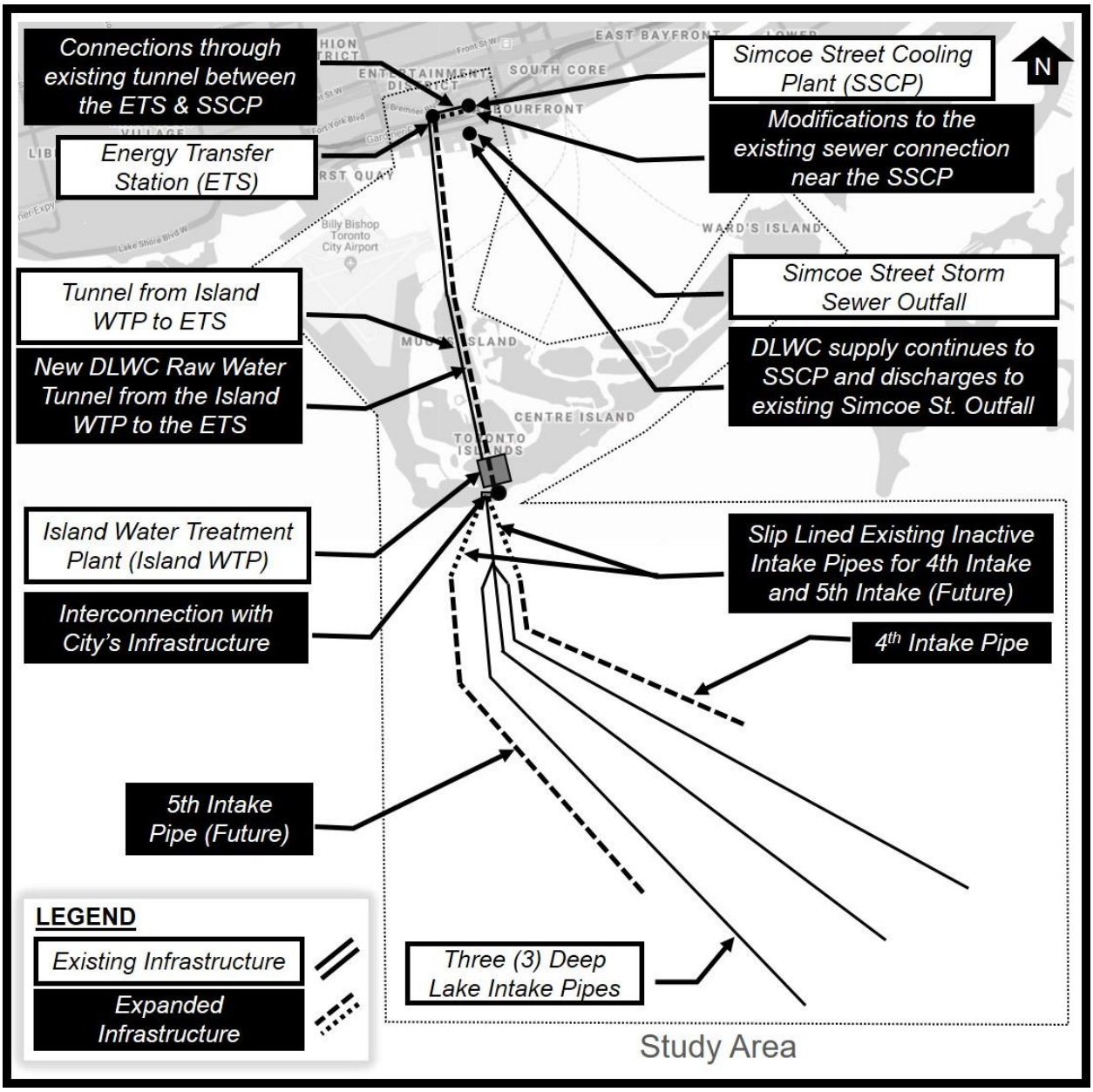
Don Ford, Senior Manager, Hydrogeology and Drinking Water Source Protection
Toronto and Region Conservation Authority
Tel: 437-880-2372
Email: don.ford@trca.ca

Date: December 7, 2022

Attachments(5):

Figure 1: Schematic of Proposed Toronto Island Intakes
Figure 2: Proposed Toronto Island Intake Vulnerability Scores
Figure 3: Proposed Toronto Island Intake Protection Zones
Figure 4: Proposed Revised Mapping of Spill Scenarios, including new Ashbridges Bay Outfall
Appendix A: Draft Section 48 Notice

Figure 1: Schematic of Proposed Toronto Island Intakes



Source: RVA for Envwave and City of Toronto, 2020.

Figure 2: Proposed Toronto Island Intake Vulnerability Scores

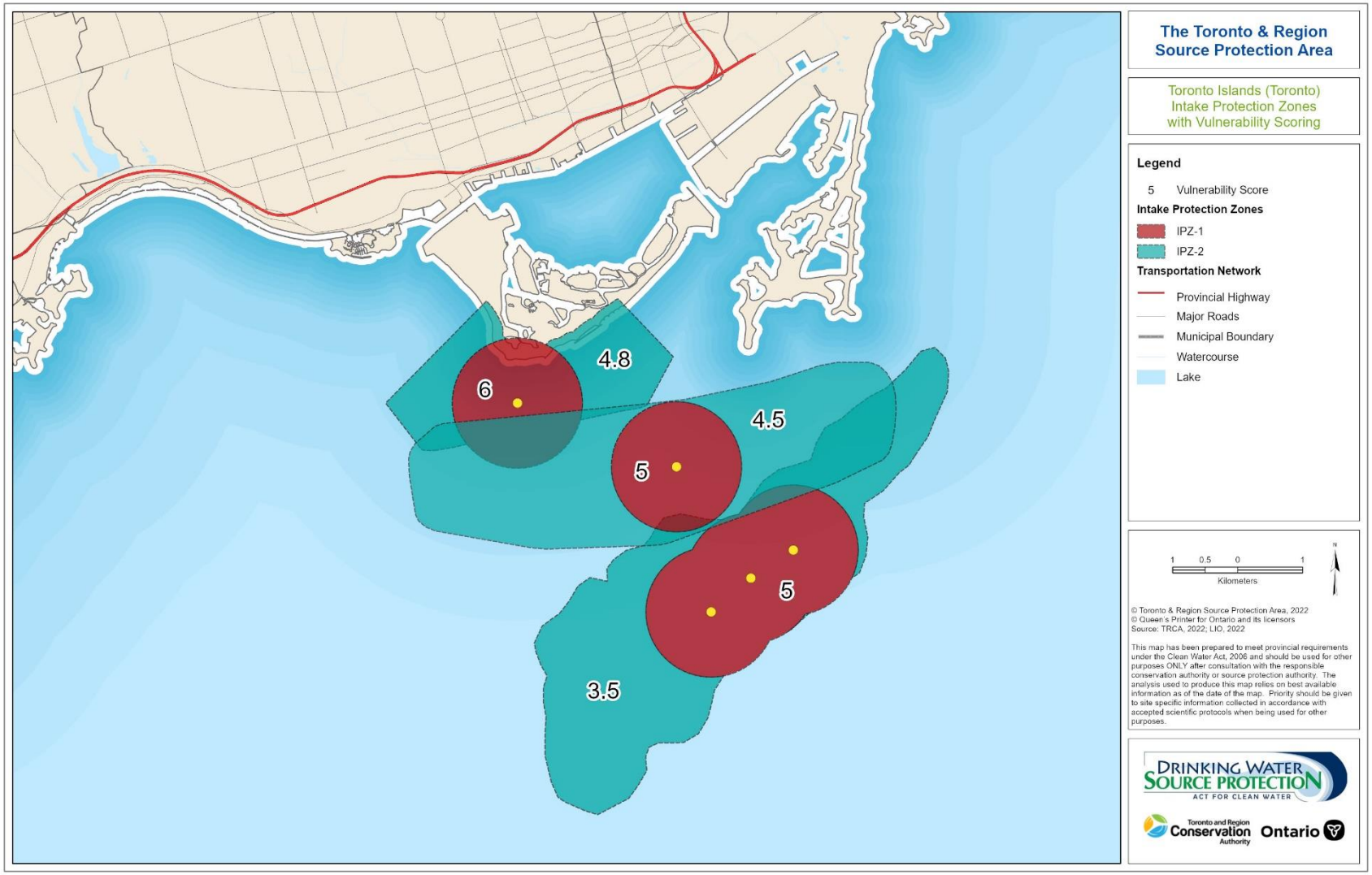


Figure 3: Proposed Toronto Island Intake Protection Zones

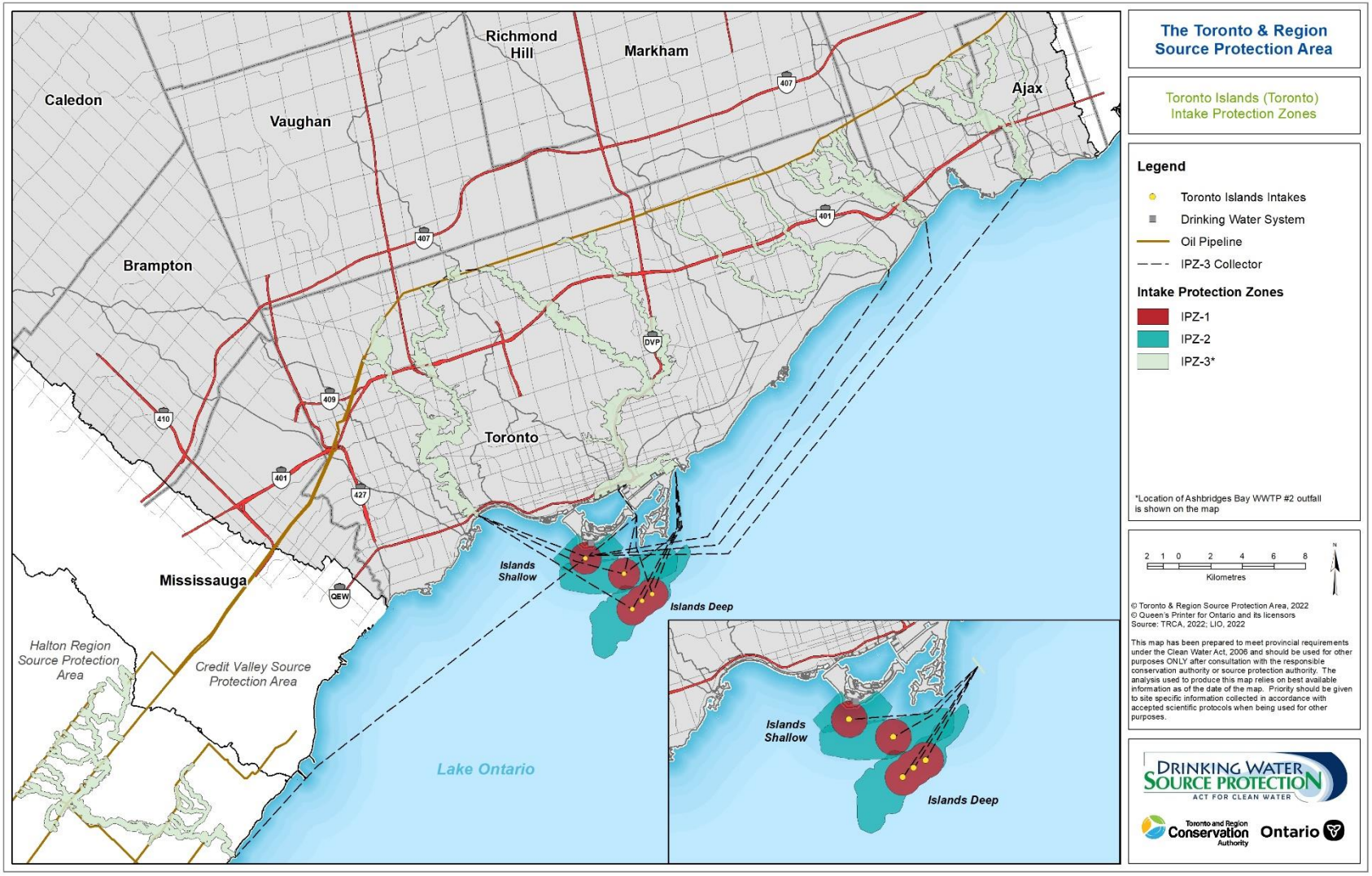
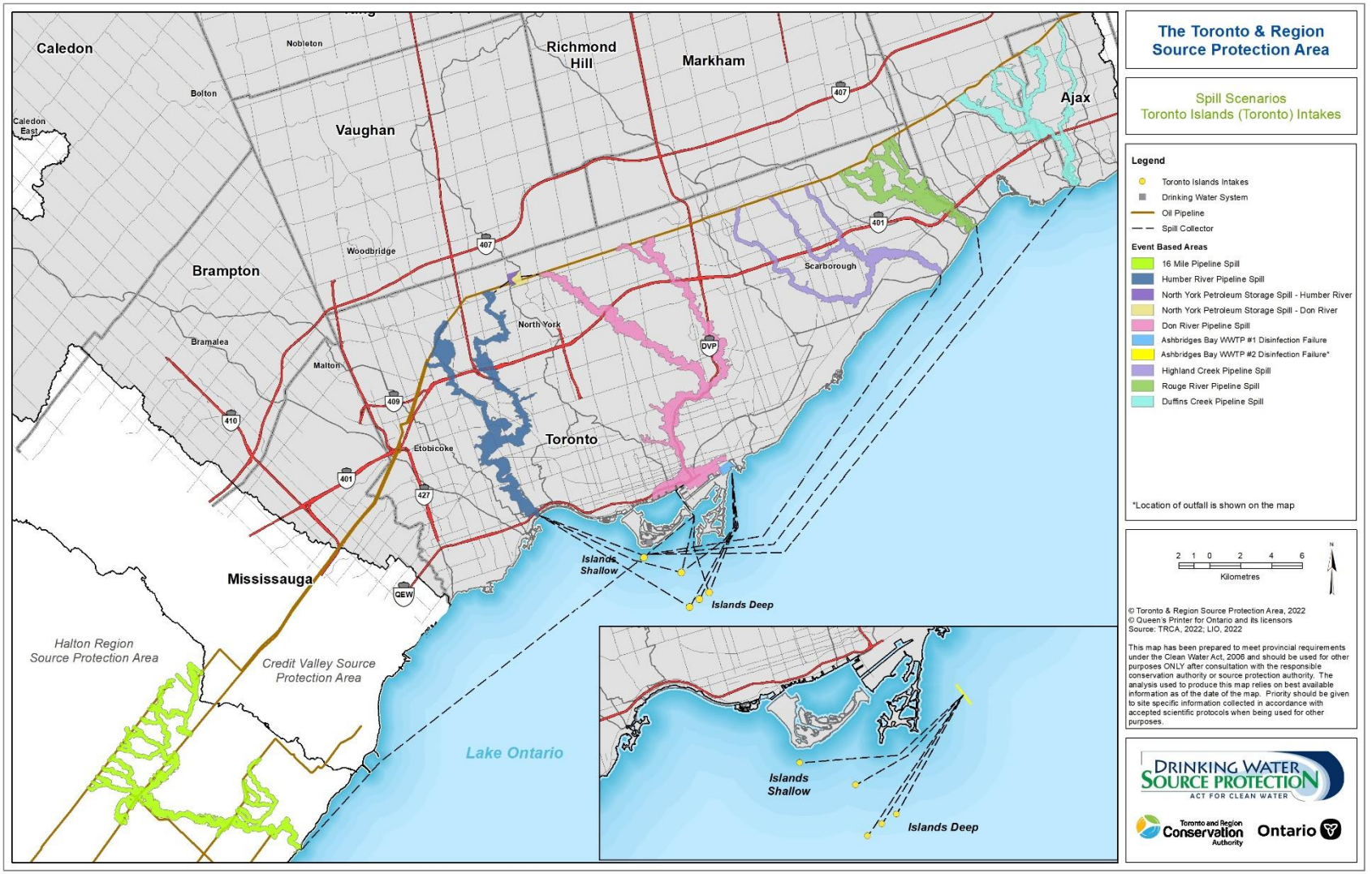


Figure 4: Proposed Revised Mapping of Spill Scenarios, including new Ashbridges Bay Outfall



Appendix A: Draft Section 48 Notice

NOTICE OF AMENDMENTS TO SOURCE PROTECTION PLAN

(pursuant to section 48(1.1)(b) of Ontario Regulation 287/07)

***Existing* or Planned Municipal Drinking Water System (System):**

Toronto Island (MECP DWSP Reference #:)

Name of Owner of Existing or Planned Municipal Drinking Water System (Owner):

City of Toronto

Applicable Source Protection Area (Source Protection Area):

Toronto and Region Source Protection Area

The **Toronto and Region Source Protection Authority** is the Source Protection Authority for the Source Protection Area under the *Clean Water Act, 2006*.

The **Toronto and Region Source Protection Authority** has received written notice from the Owner about an intended application under the *Safe Drinking Water Act, 2002* for an existing or planned System that is located within the Source Protection Area.

The **Toronto and Region Source Protection Authority** is satisfied* that the technical work required pursuant to subsection 48(1.1) of Ontario Regulation 287/07 under the *Clean Water Act, 2006* is completed for the purposes of identifying anticipated amendments to the source protection plan for the Source Protection Area.

The **Toronto and Region Source Protection Authority** anticipates the amendments set out in Schedule A of this notice will be required as a result of the intended application. The list of anticipated amendments in Schedule A is provisional and will undergo consultations with stakeholders and the source protection committee. All amendments must be approved by the Ministry of the Environment, Conservation and Parks and are subject to change after this Notice is issued. The timing for approval of the amendments by the Ministry of Environment, Conservation and Parks is not within the control of the Source Protection Authority. The Schedule A also indicates amendments that have been completed.

All actions by **Toronto and Region Source Protection Authority** for the purposes of this Notice are undertaken as the Source Protection Authority for the above noted Source Protection Area and are subject to the *Clean Water Act, 2006*. This Notice does not exempt the Owner from obtaining the required licence or permit to operate the System under the *Safe Drinking Water Act, 2002.*

Issued by: _____ **Date:** _____

* ***Satisfied*** should be interpreted that the materials needed to update the CTC Source Protection Plan have been received by Toronto and Region Source Protection Authority. Toronto and Region Source Protection Authority has not reviewed the technical data for conformity with the *Director's Technical Rules.*

Schedule A – Summary of Anticipated Amendments to the CTC Source Protection Plan for New Deep Toronto Island Intake and New Ashbridges Bay Outfall

No.	Section of CTC Source Protection Plan (including Credit Valley Assessment Report)	Brief Description of Proposed Amendment	Estimated Timing to Submit Proposed Amendment to Ministry of the Environment, Conservation, and Parks
Toronto and Region Assessment Report			
1.	Preface	Update map to include the updated intake locations	September 2023
2.	Chapter 2	Update text, maps and tables to reflect the new deep intake for the Toronto Island system	September 2023
3.	Chapter 4	Update text, maps and tables to reflect the updated information for the new Toronto Island Intake	September 2023
4.	Chapter 5	Update text, maps and tables to reflect the updated information for the new Toronto Island Intake and the new Ashbridges Bay Outfall.	September 2023
5.	Chapter 7	Update Bibliography to include new reference to Toronto's foundation memos for the updated modelling and threat assessments.	September 2023
6.	Appendices	Update appropriate figures and text to include updated hydrogeologic information	September 2023
CTC Source Protection Plan			
1.	Figure 2.2	Update map to include the updated intake locations	September 2023
2	Map 4.1: Lake Ontario Intakes – Modelled Significant Threat Locations	Update map to include the updated intake locations and WWTP Diffusers	September 2023
3.	Map 4.2: Lake Ontario Intakes – Moderate and Low Threat Locations	Update map to include the updated intake locations	September 2023

TO: Chair and Members of the CTC Source Protection Committee, Meeting #4/22

DATE: Dec 7, 2022

FROM: Don Ford, Senior Manager, Hydrogeology and Source Water Protection, Toronto and Region Conservation Authority

RE: **New Well PW7 for York Region in Nobleton**

KEY ISSUE

Obtain direction from the SPC to incorporate the new technical work for the new Well PW7 for Nobleton into the Approved Toronto and Region Assessment Report and CTC Source Protection Plan.

RECOMMENDATION

IT IS RECOMMENDED THAT the CTC SPC receive the technical work completed for the new Nobleton PW7 for incorporation into the Approved Toronto and Region Assessment Report and the CTC Source Protection Plan;

AND THAT staff be directed to take the necessary actions to proceed with the mandated pre-consultation with impacted stakeholders and 35-day public consultation required when making amendments to Source Protection Plans;

BACKGROUND

The Town of Nobleton is currently serviced by three production wells: PW2, PW3, and PW5. Because of declining well efficiency in PW3, York Region has constructed a new well, PW7, on the same property, several metres from the existing well. The existing well PW3 will be retained for back-up supply, but may be operated together with PW7 at a maximum combined rate of 28.9 L/s (the current permitted rate for PW3).

Because there will not be a change in the maximum pumping rate from this location, and the fact that the two wells are only metres apart, no changes to the wellhead protection areas (WHPA) are required; other than a new WHPA-A for PW-7, most of which overlaps with the existing WHPA-A for PW3 (Figure 1). However, the new well must be included in an updatet to the TRSPA Assessment Report and the CTC Source Protection Plan.

Section 34 Amendments

The new well PW7 will need to be included in the description (both text and tables) and mapping of the Nobleton Wellfield in Chapters 2, 4, and 5. The references in Chapter 7 and the appendices will also have to be updated to include the technical memo from York Region that describes the rationale and technical details of the new well (York Region, August 8, 2022). The mapping in the CTC Source Protection Plan will also be updated to include the new well location. Note that no new significant drinking water threats will be created, nor will any policies require revision.

Section 48 Notice

Under section 2(3) of O. Reg. 205/18, an application for an amendment to a drinking water works permit, must be accompanied by a copy of a Notice described in Clause 48 (1.1) (b) of O. Reg. 287/07. This notice contains a summary or proposed changes and indicates the Source Protection Authority has confirmed all material necessary to update the CTC Source Protection Plan have been provided. A Section 48 Notice was issues by Toronto and Region Source Protection Authority on August 25, 2022 (Appendix A).

DETAILS OF WORK TO BE DONE

Staff from the CTC, TRCA, and York Region have identified the required amendments to the Toronto and Region Assessment Report and the CTC Source Protection Plan (Schedule A in Appnedix A) and will continue to update the CTC SPC regarding the progress of these Section 34 amendments.

Report prepared by:

Don Ford, Senior Manager, Hydrogeology and Drinking Water Source Protection
Toronto and Region Conservation Authority
Tel: 437-880-2372
Email: don.ford@trca.ca

Date: December 7, 2022

Attachments(3):

Figure 1: Nobleton Well No. 7 Location and New WHPA A
Figure 2: Nobleton Wellhead Protection Areas
Appendix A: York Section 48 Notice

Figure 1: Nobleton Well No. 7 Location and New WHPA A

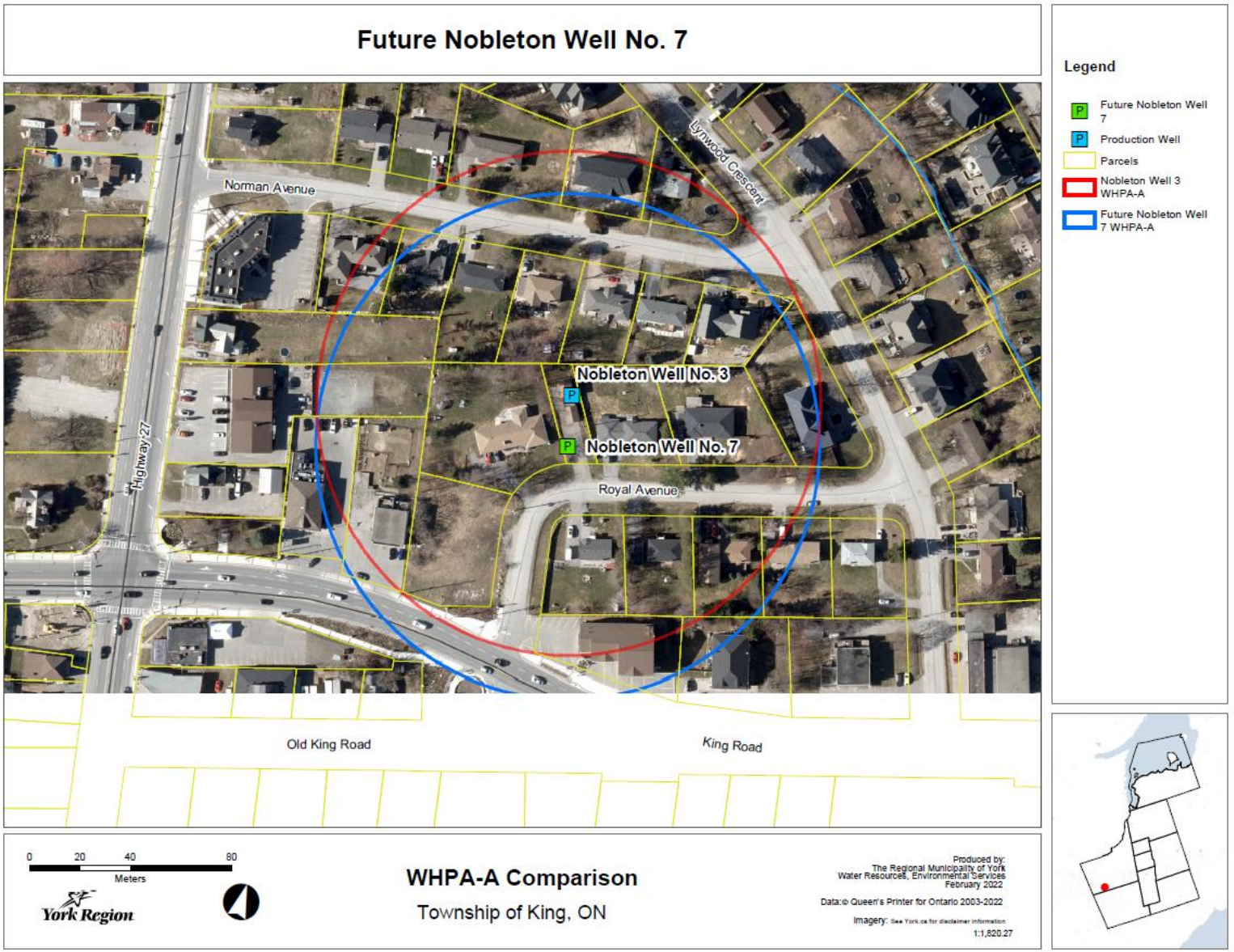
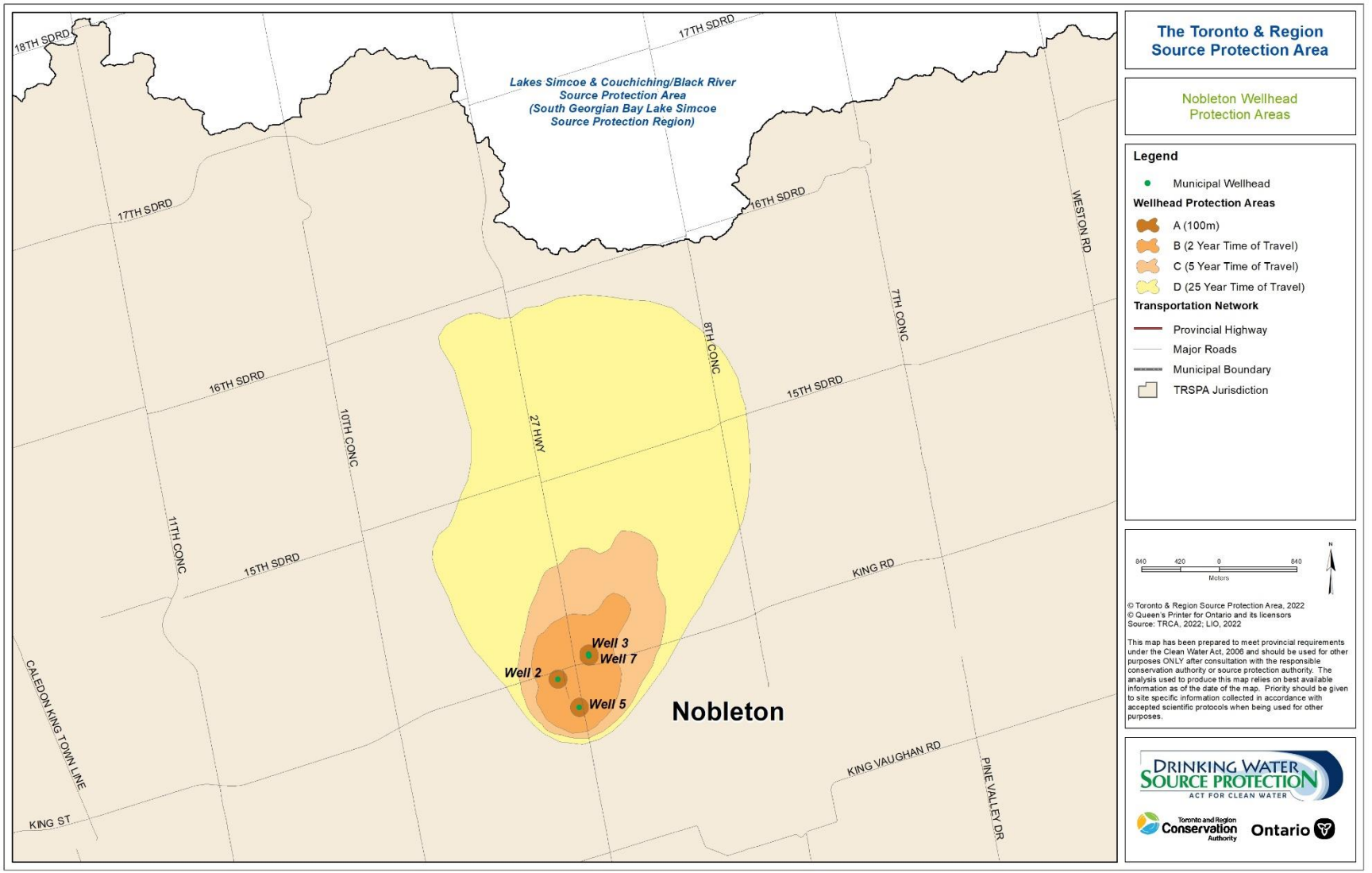


Figure 2: Nobleton Wellhead Protection Areas



Appendix A: York Section 48 Notice

NOTICE OF AMENDMENTS TO SOURCE PROTECTION PLAN

(pursuant to section 48(1.1)(b) of Ontario Regulation 287/07)

***Existing* or Planned Municipal Drinking Water System (System):**

Nobleton Drinking Water System (MECP DWSP Reference #: 220002306)

Name of Owner of Existing or Planned Municipal Drinking Water System (Owner):

Regional Municipality of York

Applicable Source Protection Area (Source Protection Area):

Toronto and Region Source Protection Area

The **Toronto and Region Source Protection Authority** is the Source Protection Authority for the Source Protection Area under the *Clean Water Act, 2006*.

The **Toronto and Region Source Protection Authority** has received written notice from the Owner about an intended application under the *Safe Drinking Water Act, 2002* for an existing or planned System that is located within the Source Protection Area.

The **Toronto and Region Source Protection Authority** is satisfied***** that the technical work required pursuant to subsection 48(1.1) of Ontario Regulation 287/07 under the *Clean Water Act, 2006* is completed for the purposes of identifying anticipated amendments to the source protection plan for the Source Protection Area.

The **Toronto and Region Source Protection Authority** anticipates the amendments set out in Schedule A of this notice will be required as a result of the intended application**†**. The list of anticipated amendments in Schedule A is provisional and will undergo consultations with stakeholders and the source protection committee. All amendments must be approved by the Ministry of the Environment, Conservation and Parks and are subject to change after this Notice is issued. The timing for approval of the amendments by the Ministry of Environment, Conservation and Parks is not within the control of the Source Protection Authority. The Schedule A also indicates amendments that have been completed.

All actions by **Toronto and Region Source Protection Authority** for the purposes of this Notice are undertaken as the Source Protection Authority for the above noted Source Protection Area and are subject to the *Clean Water Act, 2006*. This Notice does not exempt the Owner from obtaining the required license or permit to operate the System under the *Safe Drinking Water Act, 2002.*

Issued by: _____ **Date:** **August 25, 2022**

*** *Satisfied*** should be interpreted that the materials needed to update the CTC Source Protection Plan have been received by Toronto and Region Source Protection Authority. Toronto and Region Source Protection Authority has not reviewed the technical data for conformity with the *Director's Technical Rules.*

Schedule A – Summary of Anticipated Amendments to the CTC Source Protection Plan

for new well PW7 in Nobleton

As per the MECP Source Protection Program Branch's bulletin *Source Protection Bulletin: Requirements for Municipal Drinking Water Systems – August 2018* a water system owner may provide technical rationale to a source protection authority to demonstrate that no new vulnerable mapping or scores are needed, and that the well or intake is fully protected by the current vulnerable areas and plan policies.

The Toronto and Region Source Protection Authority review of York Region's application for an O. Reg. 287/07 section 48(1.1)(b) Notice concurs that Nobleton well PW7 is already fully protected by current vulnerable areas and CTC Source Protection Plan policies.

†The amendments detailed in the table below are minor in nature, and will not affect the protection already in place for the Nobleton PW7 drinking water source. As such, these updates to the CTC Source Protection Plan will be deferred until the next planned s.34 amendment, with municipal endorsement expected to be sought in early spring 2023 and public consultation in mid-late spring 2023.

No.	Section of CTC Source Protection Plan (including Toronto Region Assessment Report)	Brief Description of Proposed Amendment	Estimated Timing to Submit Proposed Amendment to Ministry of the Environment, Conservation, and Parks
Toronto and Region Assessment Report			
1.	Preface	Update Figure 7 to include the new production Well PW-7	August 2023
2.	Chapter 2	Update text, maps and tables to reflect the new production Well PW-7 in Nobleton.	August 2023
3.	Chapter 4	Update text, maps and tables to reflect the new production Well PW-7 in Nobleton. The added well will resulted in a slight increase in area identified as high vulnerability WHPA-A.	August 2023
4.	Chapter 5	Update text, maps and tables to reflect the new production Well PW-7 in Nobleton. No additional properties within the new WHPA-A area or new drinking water threats were identified.	August 2023
5.	Chapter 6	Update text and Table 6-1 to include the new production Well PW-7	August 2023
15.	Chapter 7	Update Bibliography to include new reference to York's foundation memo for the new well.	August 2023
16.	Appendices D&E	Update appropriate figures and text to include new well PW-7 in Nobleton and references to the foundation memo that explains why capture zones and derived calculations are not being amended.	August 2023
CTC Source Protection Plan			
1.	Figure 2.2, Map 1.17, Map 2.17, Map 3.5	Update figure/maps to include new well PW-7 in Nobleton.	August 2023
2.	Table 6-1	Update municipal well count	August 2023

TO: Chair and Members of the CTC Source Protection Committee, Meeting #4/22

DATE: December 7, 2022

FROM: Behnam Doulatyari, Senior Manager, Watershed Plans and Source Water Protection

RE: Proposed amendments to Toronto Region and Credit Valley Assessment Reports and CTC Source Protection Plan

KEY ISSUE

Obtain direction from the SPC to take the necessary actions to proceed with the mandated pre-consultation with impacted stakeholders and 35-day public consultation for the proposed amendments to the Approved Toronto and Region Assessment Report, the Approved Credit Valley Assessment Report, and the Approved CTC Source Protection Plan and Explanatory Document.

RECOMMENDATION

THAT staff be directed to incorporate the proposed amendments, to the Approved Toronto and Region Assessment Report, Approved Credit Valley Assessment Report, and the CTC Source Protection Plan, previously endorsed by the CTC SPC for inclusion within this section 34 amendment;

AND THAT staff be directed to take the necessary actions to proceed with the mandated pre-consultation with impacted stakeholders and 35-day public consultation required when making amendments to Source Protection Plans;

AND THAT the CTC SPC authorize the Amendments Working Group to reconvene to undertake a review of the feedback obtained as a result of the pre-consultation and mandated 35-day consultation period;

AND FURTHER THAT staff be directed to take the necessary actions to acquire endorsement of amendments to the Approved Toronto and Region Assessment Report, Approved Credit Valley Assessment Report, and the CTC Source Protection Plan prior to submission to the Ministry.

BACKGROUND

Section 34 of the *Clean Water Act, 2006* provides the option for Source Protection Authorities (SPA), with support from the Source Protection Committee (SPC), to make amendments to a Source Protection Plan (SPP) that cannot wait until a section 36 update and do not qualify as minor administrative amendments under Section 51 of the O. Reg. 287/07. This is a prescriptive process with extensive stakeholder consultation and a requirement for council endorsement from affected municipalities. Therefore, where possible, amendments to the SPP are bundled to improve efficiency. CTC and municipal staff have been working collaboratively to revise select policies highlighted by Risk Management Officials as priorities to support implementation.

The proposed amendments include changes to drinking water systems in the Regional Municipality of Peel, Regional Municipality of York, and City of Toronto, as well as revised DNAP-1, OS-1, existing threat activity definition, and transition and timeline policies. The proposed amendments and timelines were presented to the Amendments Working Group on Nov 8th, 2022 and received support to proceed. Staff were instructed to report back with comments, received during the pre-consultation with impacted stakeholders and 35-day public consultation, to the Amendments Working Group for review.

PROPOSED AMENDMENTS

Regional Municipality of Peel

Technical work included an allocation increase at Palgrave Well 4, delineation of a WHPA for the new Caledon East Well 6, and delineation of a WHPA for the existing Caledon Village Well 3B. Aquifer vulnerability assessment, vulnerability scoring, managed lands, livestock density, and percent imperviousness mapping were completed according to the 2021 Director's Technical Rules (DTR's). Transport pathways analysis was completed according to the methods outlined in the Credit Valley Source Protection Area Transport Pathway Assessment Technical Report (2022), described in Committee Report 8.1c.

It should be noted that some wells in the Palgrave-Caledon East Drinking Water System straddle the boundaries of Toronto and Region Source Protection Area (TRSPA), and Nottawasaga Valley Source Protection Area (NVSPA). The Caledon Village well is located within the Credit Valley Source Protection Area (CVSPA), As part of the s.34 amendment, Assessment Reports for all three SPAs (TRSPA, NVSPA, CVSPA), and the CTC SPP will be updated. Further details for the proposed amendments can be found in Committee Report 8.1d. Early engagement with MECP staff commenced Oct. 27, 2022, feedback is anticipated in early December. A joint Section 48 Notice from the SPAs to Peel is anticipated in December 2022.

City of Toronto

Technical work included analysis of significant drinking water threats for the new Toronto Island Water Treatment Plant Intake and risks posed by the new Ashbridges Bay Treatment Plant Outfall on all intakes considered in the existing Toronto and Region Assessment Report. As part of the amendment, the Toronto and Region Assessment Report and CTC SPP will be updated. Minor changes to the Credit Valley and Central Lake Ontario Assessment Reports will be done to note the impact of the outfall to intakes in their jurisdictions. Halton Hamilton Source Protection Region will also be notified of the change because the new Ashbridges Bay Treatment Plant Outfall, like the existing outfall, poses a significant drinking water threat to Oakville intakes.

Further details for the proposed amendments can be found in Committee Report 8.1e. Early engagement with ministry staff commenced on Oct. 27, 2022, and first round of comments were received on November 28, 2022 (Attachment 1).

Regional Municipality of York

Technical work included addition of the new Well PW7 for Nobleton and associated WHPA-A, into the Toronto and Region Assessment Report and CTC Source Protection Plan. Further details for the proposed amendments can be found in Committee Report 8.1f. Municipal staff from York

Region have since provided updated managed lands, livestock density, percent imperviousness mapping completed according to 2021 DTR's. Early engagement with ministry staff was started on Oct. 27, 2022; feedback is expected in early December.

Policies

During Meeting #1/22 on February 15, 2022, the CTC SPC endorsed (Attachment 2) amending DNAP-1 and OS-1 policies (Attachments 3,4,5), and the definition of existing threat activity, transition policy and timelines for policy implementation (Attachments 6,7) within the CTC SPP. The proposed changes to the explanatory document are currently in development and will be included in the pre-consultation package sent to the affected municipalities.

Chapter 10 of CTC SPP includes text and tables that outlines where each prescribed threat may be considered a significant drinking water threat. This identification is based on the provincial Table of Drinking Water Threats. As a result of technical work for municipal drinking systems using different versions (i.e., 2009, 2013, 2017, 2021) of the Tables of Drinking Water Threats, this information will be updated to ensure clarity of where significant threats can occur for all drinking water systems included in the SPP. An updated Table 10.12 for DNAPLs has been provided below as an example.

Prescribed Drinking Water Threat	**Threat Sub-Category**	**Area and Vulnerability Score (VS)**	**Threat Classification Level**
			Significant
			2009/2013/2017/2021 DTR's
The handling and storage of a DNAPL	The handling and storage of a DNAPL	WHPA-A/B/C (VS = Any Score)	✓

Timelines

The timelines for the proposed amendment presented to the Amendments Working Group on November 8, 2022 have been modified to allow additional time for preparing the pre-consultation package. This revised timeline was brought to the Municipal Implementation Working Group on November 23, 2022 and is presented in the table below.

Given the proposed changes to policy, all municipalities in the CTC Source Protection Region (CTC SPR) will be informed of the upcoming changes. However, council resolutions would be required only from those municipalities affected by the proposed changes. Municipalities not affected by the proposed changes must inform CTC staff in writing their decision that a council resolution is not required.

Section 34 Step	**Date**
Early engagement (MECP) commenced	Oct. 27, 2022
SPC meeting	Dec. 7, 2022
Municipal review of draft AR/SPP/ED revisions	Jan. 2023 (Text) Feb. 2023 (Figures)

Municipal feedback deadline	Feb. 20, 2023
Pre-consultation notices/package to implementing bodies	Mar. 10, 2023
Municipal endorsement deadline	May 21, 2023
Public consultation	Jun. 5-Jul. 12, 2023
AWG considers feedback; SPA endorsements	Jul./Aug. 2023
Submission to MECP	Sep. 2023

DETAILS OF WORK TO BE DONE

Pending endorsement from the CTC SPC, staff will prepare the consultation package to show all proposed amendments to the Toronto and Region Assessment Report, Credit Valley Assessment Report, and CTC Source Protection Plan and Explanatory Document. Amendments to all documents will be tracked in red text, a summary of these amendments will also be provided.

Following consultation, staff will report back to the Amendments Working Group on any comments received and any matters which were raised; and will bring forward recommendations to address any issues.

After the Amendments Working Group approves the amendments to all documents, the CTC SPC will be advised via electronic mail. The updated documents will be submitted by the CTC Source Protection Committee Chair to the Chair of each source protection authority for their joint submission to the Minister of the Environment, Conservation, and Parks in September 2023.

Report prepared by:

Behnam Doulatyari, Senior Manager, Watershed Plans and Source Water Protection
T: 905-670-1615, ext. 379
Email: behnam.doulatyari@cvc.ca

Date: November 30, 2022

Attachments (7):
Attachment 1: Early Engagement comments on technical work to support amendments to the Toronto Region AR and CTC SPP
Attachment 2: Minutes from CTC SPC Meeting #1/22, February 15, 2022
Attachment 3: Committee Report for Endorsement of Amended DNAP-1 and OS-1 Policies of the CTC SPP, February 15, 2022
Attachment 4: Proposed amendments to policy DNAP-1
Attachment 5: Proposed amendments to policy OS-1
Attachment 6: Committee Report for Endorsement of Amended Existing Threat Activity Definition, and Transition and Timeline Policies of the CTC SPP, February 15, 2022
Attachment 7: Proposed amendments to Existing Threat Activity Definition, and Transition and Timeline Policies

Ministry of the Environment, Conservation and Parks

Conservation and Source Protection Branch

14th Floor
40 St. Clair Ave. West
Toronto ON M4V 1M2

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

Direction de la protection de la nature et des sources

14e étage
40, avenue St. Clair Ouest
Toronto (Ontario) M4V 1M2

Ontario

November 28, 2022

To: Benham Doulatyari, Project Manager
CTC Source Protection Region

From: Angelune Des Lauriers, Program Analyst
Conservation and Source Protection Branch
Ministry of Environment, Conservation and Parks (MECP)

Re: Early Engagement comments on technical work to support amendments to the Toronto Region Assessment Report and CTC Source Protection Plan

Dear Benham,

Thank you for providing the Conservation and Source Protection Branch (CSPB) with the technical work supporting proposed amendments to the CTC Source Protection Plan and the assessment report for Toronto Region Source Protection Area.

CSPB technical staff (hydrologist, hydrogeologist, engineer) have reviewed the documents provided. The comments below are intended to provide clarity and improve technical accuracy. We also note that CSPB expects that future amendments to the assessment report will reflect the technical work submitted, including a revised threats enumeration (if any) and the uncertainty analysis.

- Please clarify the intent of using the mid-depth layer in the particle tracking method to determine the IPZ-2 boundary and not other layers, e.g., the surface layer.
- Please clarify the assumption behind using the E. coli peak concentration of 532 CFU/100ml as a constant value over the 48-hr to estimate the E.coli concentration in the Inner Harbour. Typically, the concentration follows the bell distribution function for such spills.

If you have questions, please do not hesitate to contact me by email at Angelune.DesLauriers@ontario.ca or Beth Forrest, Liaison Officer, at Elizabeth.Forrest@ontario.ca.

Angelune Des Lauriers
Program Analyst, Conservation and Source Protection Branch
289-237-3062 | Angelune.DesLauriers@ontario.ca

CC: Jennifer McKay, Manager, Source Protection Section, CSPB
Wendy Lavender, Manager, Technical and Program Delivery Section, CSPB
George Jacoub, Hydrologist, CSPB
Elizabeth Forrest, Liaison Officer, CSPB
Craig Jacques, Specialist, Watershed Plans and Source Water Protection, Credit Valley Conservation

CTC Source Protection Committee Meeting #1/22

Chair: Douglas Wright

Tuesday February 15, 2022
1:00 – 4:00 p.m.
Zoom Virtual Meeting[1]

APPROVED MINUTES

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1. **Call to Order and Roll Call**

The Chair called to the meeting to order at 1:04 p.m.

Certification of Quorum - 15 Members Constitute a Quorum (2/3 of Members plus Chair)

Members present: Julie Abouchar, Liza Ballantyne, Dan Bunner, Ken Dion, Behnam Doulatyari, Louise Foster, Chris Gerrits, Lee Gould, Rosemary Keenan, Dave Kentner, Scott Lister, Peter Miasek, Gary Mountain, Elvis Oliveira, John Presta, Frank Quarisa, Chair Douglas Wright

Regrets: Geoff Maltby, Jeff Light

Quorum was achieved.

MECP Liaison: Beth Forrest

Source Protection Authority Liaison: Quentin Hanchard (CVC-lead SPA), John MacKenzie (TRCA)

The following CTC SPA staff were in attendance: Josh Campbell, Don Ford, Parastoo Hosseini, Janet Ivey, Craig Jacques, Chris Jones, Annie Li, Daniela MacLeod, Laurie Nelson, Daniel Pina, John Sinnige, Gayle Soo Chan, Jeff Thompson, Rod Wilmot

Others in attendance: Debbie Balika, Daniel Banks, Jon Clark, Kyle Davis, Therese Estephan, Stefan Herceg, Erin Ihnat, Muriel Kim-Brisson, Malcolm Light, Tavis Nimmo, Hayley Pankhurst, Bill Snodgrass, Tiffany Svensson, Emily Vandermeulen, Brandon Ward

2. **Review of Agenda**

Moved by: D. Kentner
Seconded by: R. Keenan

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

Resolution #1/22:
THAT the agenda of February 15, 2022 be approved as distributed.
CARRIED

3. **Disclosure of Conflict of Interest**

There were no disclosures of conflicts of interest.

4. **Minutes of Previous Meetings**

Moved by: L. Gould
Seconded by: K. Dion

Resolution #2/22:
THAT the minutes of the September 21, 2021 meeting be approved as circulated.
CARRIED

5. **Chair's Remarks**

5.1 Introduction of new Source Protection Committee members

On November 12, 2021 the Credit Valley Source Protection Authority appointed the following new member to the CTC Source Protection Committee for a 5-year term.

1. Behnam Doulatyari, to serve as a public interest representative.

On January 21, 2022 the Credit Valley Source Protection Authority appointed the following new member to the CTC Source Protection Committee for a 5-year term.

1. Liza Ballantyne, to represent the City of Toronto as a municipal sector representative.

Deborah Martin-Downs, former CAO of Credit Valley Conservation (CVC), was thanked for her many years of service.

5.2 Introduction of Quentin Hanchard, CAO of Credit Valley Conservation

Q. Hanchard joined Credit Valley Conservation (CVC) as CAO/Secretary-Treasurer on in December 2021; and will act as the lead Source Protection Authority liaison to the CTC Source Protection Committee.

6. **Updates**

6.1 Update from the Ministry of Environment, Conservation and Parks (MECP) Liaison Officer – Beth Forrest

Updated Director's Technical Rules for assessing vulnerability and risks under the *Clean Water Act, 2006* were released in December 2021. MECP guidance on these updated Rules were released today.

An online Best Practices for Source Water Protection guide was released February 18, 2022; the guide is intended to support practices for areas and

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water supplies not covered by the Drinking Water Source Protection program.

6.2 Update from Conservation Ontario Source Water Protection Lead – Debbie Balika
Conservation Ontario is providing support to Source Protection Regions on the updated Director's Technical Rules, and to consider a recent Canada Energy Regulator on-land pipeline discussion paper.
A Winter Wednesday's social media campaign and upcoming working group meeting are both aimed at road salt best practices.

6.3 Update from Conservation Authority Liaison – Quentin Hanchard, CAO of Credit Valley Conservation
Conservation Authorities continue to work with municipalities in response to recent changes to the *Conservation Authorities Act* and regulations. The Province has indicated its continued commitment to funding the Drinking Water Source Protection program.

7. **Presentations**

7.1 Lake Ontario Drinking Water Intakes – Overview of Vulnerabilities and Threats. Janet Ivey, CTC Program Manager
Sixteen Lake Ontario municipal intakes across the CTC provide water to about seven million people. Potential spill scenarios that could affect these intakes were identified by the Lake Ontario Collaborative Group (LOCG) and included in Assessment Reports. Upcoming work includes: a new Toronto drinking water intake; Peel Region WWTP capacity increases; and a Durham Region EA and Phosphorus Study for their Duffins Creek WPCP.

7.2 Lake Ontario Collaborative Group Update. John Presta, Director, Environmental Services, Durham Region, and Chair, Lake Ontario Collaborative Group
The LOCG consists of Peel, Toronto and Durham. They are developing modelling and monitoring tools to better understand Lake Ontario circulation and water quality. A Decision Support System is currently being tested to allow improvement assessment in case of a spill.

7.3 Duffin Creek Water Pollution Control Plant Upgrades, John Presta
Plant treats wastewater for York & Durham serving about 1.2 million people. Several studies on a planned expansion have been completed to meet MECP's requirements.

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

Moved by: L. Gould
Seconded by: S. Lister

Resolution #3/22:
THAT the presentations be received.
CARRIED

At 2:49 p.m. the Chair requested a brief break in the meeting

At 2:52 p.m. the meeting was reconvened
Quorum was confirmed.

8. **Committee Business**

8.1 Reports to Committee

a. Program Update

J. Ivey provided a brief overview of the revised Director's Technical Rules, staff will bring a detailed report on the implications to a future SPC meeting.
CTC Conservation Authorities are reviewing several recent ERO proposals: Subwatershed Planning Guide, Municipal Wastewater and Stormwater Management in Ontario Discussion Paper, and a Low Impact Development Stormwater Management Guidance Manual.
A draft report on the Transport Pathways Pilot Study has been provided to municipalities for review, a report will be brought to the SPC later this year.

Moved by: L. Gould
Seconded by: P. Miasek

Resolution #4/22:
IT IS RECOMMENDED THAT the CTC Source Protection Committee receive the staff report CTC Program Update for information.
CARRIED

b. Amendments Working Group Update

D. Kentner provided an overview of this group, noting it was established by the SPC in 2016 to work with staff and municipalities to develop recommendations, for the SPC, on amendments to the CTC Source Protection Plan. With the s.36 workplan now progressing there is a need to revisit the group's mandate, structure and composition.

Moved by: D. Kentner
Seconded by: B. Doulatyari

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

Resolution #5/22:
IT IS RECOMMENDED THAT the CTC Source Protection Committee receive the staff report Amendments Working Group Update for information.
AND FURTHER THAT staff be directed to establish a Terms of Reference to guide the work of the Amendments Working Group.
CARRIED

c. Municipal Progress on Risk Management Plans for Existing Significant Drinking Water Threats

J. .Ivey provided a brief update on progress to complete all required Risk Management Plans (RMPs) to meet the revised deadline, as per the s.58 RMP extension. Pandemic constraints again slowed progress on RMP negotiations in 2021.

Moved by: R. Keenan
Seconded by: J. Abouchar

Resolution #6/22:
IT IS RECOMMENDED THAT the CTC Source Protection Committee receive the staff report Municipal Progress on Risk Management Plans for Existing Significant Drinking Water Threats for information.
CARRIED

d. Endorsement of Amended DNAP-1 and OS-1 Policies of the CTC Source Protection Plan

Following Meeting #3/21, in accordance with RES. #16/21, staff consulted with the Amendments Working Group on further refinements to Source Protection Plan policies DNAP-1 and OS-1. The Committee discussed the implications of shifting from prohibition to using risk management for DNAPL and organic solvent threats in more areas.

Moved by: L. Foster
Seconded by: E. Oliveira

RESOLUTION #7/22:
IT IS RECOMMENDED THAT the CTC Source Protection Committee receive the staff report Endorsement of Amended DNAP-1 and OS-1 Policies of the CTC Source Protection Plan for information;
AND FURTHER THAT the CTC Source Protection Committee endorse amending policy DNAP-1 to adopt a risk management approach to future significant drinking water

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

threats from DNAPLs of a total volume of 25-250 L in WHPA-B, -C, -E;

AND FURTHER THAT the CTC Source Protection Committee endorse amending policy OS-1 to adopt a risk management approach to future significant drinking water threats from organic solvents in WHPA-B;

AND FURTHER that staff be directed to incorporate the new policy text as part of a forthcoming amendment to the CTC Source Protection Plan, under Section 34 or Section 36 of the Clean Water Act.

CARRIED

e. Endorsement of Amended Existing Threat Activity Definition, and Transition and Timeline Policies of the CTC Source Protection Plan

The CTC Source Protection Plan (SPP) definition of existing threat activity, transition policy and timelines for policy implementation require clarifications to deal with two situations. Firstly, how they apply to new vulnerable areas and significant drinking water threats. Secondly, to amend SPP policy T-6 to reflect the revised timelines for completion of risk management plans for existing significant threats. Proposed amendments were reviewed by the CTC Amendments Working Group and MECP.

Moved by: S. Lister
Seconded by: B. Doulatyari

RESOLUTION #8/22:

THAT the CTC Source Protection Committee receive the staff report Endorsement of Amended Existing Threat Activity Definition, and Transition and Timeline Policies of the CTC Source Protection Plan for information;

AND FURTHER THAT the CTC Source Protection Committee endorse amendments to the definition of existing threat activity, and transition and timeline policies, to clarify their applicability to amendments to the CTC Source Protection Plan and update implementation timelines;

AND FURTHER that staff be directed to incorporate the new policy text as part of a forthcoming amendment to the CTC Source Protection Plan, under Section 34 of the Clean Water Act.

CARRIED

8.2 Other Business

9. **Correspondence**

9.1 Email advising of a new Director of the Conservation and Source Protection Branch. June 18, 2021. To DWSP Program Managers from Chloe Stuart, Assistant Deputy Minister, Land and Water Division, Ministry of the

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

Environment, Conservation and Parks.

9.2 Email advising of update to the Director's Technical Rules. December 3, 2021. To DWSP Program Managers from Kirsten Corrigal, Director, Conservation and Source Protection Branch, Ministry of the Environment, Conservation and Parks.

9.3 Email advising of staffing changes in Conservation and Source Protection Branch. January 10, 2022. To DWSP Program Managers from Kirsten Corrigal, Director, Conservation and Source Protection Branch, Ministry of the Environment, Conservation and Parks.

9.4 Letter advising of an upcoming provincial workshop on road salt use and management in Ontario. January 28, 2022. To DWSP Program Managers from Chloe Stuart, Assistant Deputy Minister, Land and Water Division, Ministry of the Environment, Conservation and Parks.

Moved by: J. Abouchar
Seconded by: P. Miasek

Resolution #9/22:
THAT the correspondence be received.
CARRIED

10. **Next Meeting**
March 22, 2022 1:00 p.m. (via zoom)

11. **Adjourn**

Moved by: K. Dion
Seconded by: B. Doulatyari

Resolution #10/22:
THAT the CTC Source Protection Committee meeting of February 15, 2022 be adjourned.
CARRIED

The meeting adjourned at 3:57 p.m.

[1] CTC Source Protection Committee meetings are video recorded for the purpose of minute taking.

ATTACHMENT 3: COMMITTEE REPORT FOR ENDORSEMENT OF AMENDED DNAP-1 AND OS-1 POLICIES OF THE CTC SPP, FEBRUARY 15, 2022

TO: Chair and Members of the Source Protection Committee Meeting #1/22

DATE: February 15, 2022

FROM: Janet Ivey, Chief Specialist, Watershed Plans and Source Water Protection, Credit Valley Conservation

RE: Endorsement of Amended DNAP-1 and OS-1 Policies of the CTC Source Protection Plan

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KEY ISSUE

A proposal to amend the CTC Source Protection Plan policies for dense non-aqueous phase liquids (DNAPLs) and organic solvents (OS).

RECOMMENDATION

IT IS RECOMMENDED THAT the CTC Source Protection Committee receive the staff report Endorsement of Amended DNAP-1 and OS-1 Policies of the CTC Source Protection Plan for information;

AND FURTHER THAT the CTC Source Protection Committee endorse amending policy DNAP-1 to adopt a risk management approach to future significant drinking water threats from DNAPLs of a total volume of 25-250 L in WHPA-B, -C, -E;

AND FURTHER THAT the CTC Source Protection Committee endorse amending policy OS-1 to adopt a risk management approach to future significant drinking water threats from organic solvents in WHPA-B;

AND FURTHER that staff be directed to incorporate the new policy text as part of a forthcoming amendment to the CTC Source Protection Plan, under Section 34 or Section 36 of the Clean Water Act.

REPORT

Background

Ontario Regulation 287/08 under the *Clean Water Act, 2006*, identifies the handling and storage of dense non-aqueous phase liquids (DNAPLs) and organic solvents as prescribed drinking water threats. On September 21, 2021, the CTC Source Protection Committee (CTC SPC) received a report that summarized:

- Current CTC Source Protection Plan policies for DNAPLs and organic solvents (included as Attachment A);
- A review of DNAPL and organic solvent policies from other Source Protection Regions;
- The results of consultation with municipal staff, Source Protection Authority

staff, Oak Ridges Moraine Groundwater Program staff, and CTC SPC members;
- Limitations on successful implementation of the current policies; and
- Policy alternatives to address the implementation challenges.

The policy review intended to determine:
- Whether future prohibition of DNAPLs and organic solvents is necessary or whether a risk management approach would achieve the desired result more effectively; and
- Whether a clearer exception for small quantities of DNAPLs and organic solvents should be added to the policies to exclude situations where the storage and handling of these materials are unlikely to result in a risk to sources of drinking water.

The CTC SPC supported introduction of volume-based thresholds to determine when DNAPLs will be managed by prohibition, risk management, or education and outreach. The Committee also supported adopting a risk management approach for DNAPLs of a total volume of 25-250L (future significant threats) in WHPA-C and -E. The risk management approach for future threats is intended to mitigate the potential for missed changeover in businesses to result in the introduction of new threats, with the effect of greater protection of drinking water sources. A risk management approach allows for greater engagement of businesses by municipal Risk Management Officials. Topics flagged for additional discussion included adopting a risk management approach for DNAPLs in WHPA-B (future significant threats) and alignment of policies for DNAPLs and organic solvents.

A revised DNAP-1 policy was considered by the Amendments Working Group on November 15, 2021. The Working Group supported adopting a risk management approach for DNAPLs of a total volume of 25-250L (future significant threats) in WHPA-B. The rationale for this change is the same as that described above. Members of the Working Group suggested clarification may be needed regarding policy applicability for pure-phase DNAPLs, DNAPL mixtures, and products potentially containing DNAPLs. Staff from the Ministry of the Environment, Conservation and Parks advised that the clarification could be included in the Explanatory Document.

A final revised DNAP-1 policy and revised OS-1 policy (aligning with DNAP-1 by adopting a risk management approach for future significant threats in WHPA-B) was circulated by email for review by the Amendments Working Group in January 2022. The comments received were generally supportive.

Proposed Policy Amendments

Attached Tables 1 and 2 present proposed amendments to policies DNAP-1 and OS-1, respectively. No changes are proposed to DNAP-2 and -3 or OS-2 and -3 policies. In summary, the proposed amendments:
- Introduce volume-based thresholds to determine when DNAPLs will be managed by prohibition, risk management, or education and outreach;

- Adopt a risk management approach for DNAPLs of a total volume of 25-250L (future significant threats) in WHPA-B, -C and -E;
- Adopt a risk management approach for organic solvents (future significant threats) in WHPA-B; and
- Include minor revisions to remove or clarify references to vulnerability scoring and align with the current Director's Technical Rules (2021).

To support the proposed policy amendments, the text of the Explanatory Document will be updated to describe the policy rationale and clarify policy applicability for pure-phase DNAPLs, DNAPL mixtures, and products potentially containing DNAPLs.

Members of the CTC Source Protection Committee are requested to endorse the amended policies.

Summary and Next Steps

Pending endorsement of the policy amendments by the CTC SPC, Source Protection Authority staff will prepare edits to the CTC Source Protection Plan and Explanatory Document. Through discussion with the Amendments Working Group and the MECP, a timeline for amending the policies will be determined (i.e., may proceed with an upcoming s. 34 amendment in 2022-2023, or as part of the comprehensive s. 36 amendment in 2024 or later).

Report prepared by:

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Date: February 1, 2022

Attachments: 3

Table 1: Proposed amendments to policy DNAP-1

Table 2: Proposed amendments to policy OS-1

Attachment A: CTC Source Protection Plan DNAP and OS Policies (approved December 5, 2019)

Attachment A: CTC Source Protection Plan DNAP and OS Policies (approved December 5, 2019)

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** Where the handling and storage of a DNAPL is, or would be, a significant drinking water threat, the following actions shall be taken: 1) The handling and storage of a DNAPL in any quantity (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: • WHPA-A (future); or • WHPA-B (future); or • WHPA-C (future); or • WHPA-E (VS = 10) (future).	See Maps 2.1 - 2.21	Future: Immediately (T-5)	GEN-1	MON-2
			H	2) The handling and storage of a DNAPL in any quantity (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: • WHPA-A (existing); or • WHPA-B (existing); or • WHPA-C (existing); or • WHPA-E (VS = 10) (existing).		Existing: 1 year/ 5 years (T-6)	GEN-1 GEN-2	MON-2

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 MOECC	E K	**Education and Outreach** 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: 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 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: • WHPA-A (existing, future); or • WHPA-B (existing, future); or • WHPA-C (existing, future); or • WHPA-E (VS = 10) (existing, future). Where appropriate education and outreach materials prepared by the Ministry of the Environment and Climate Change 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 MON-4

Policy ID	Threat Description	Implementing Body	Legal Effect	Policy	Where Policy Applies	When Policy Applies	Related Policies	Monitoring Policy
DNAP-3	**Low Threats** Handling and Storage of a Dense Non-Aqueous Phase Liquid	Municipality	J	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: • WHPA-D (existing, future); or • WHPA-E (VS ≥ 4.8 and <10) (existing, future); or • HVA (existing, future); or • SGRA (VS = 6) (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** Where the handling and storage of an organic solvent is, or would be, a significant drinking water threat, the following actions shall be taken: 1) 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 areas: • WHPA-A (future); or • WHPA-B (VS = 10) (future); or • WHPA-E (VS = 10) (future).	See Maps 1.1 - 1.21	Future: Immediately (T-5)	GEN-1	MON-2
			H	2) 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: • WHPA-A (existing); or • WHPA-B (VS = 10) (existing); or • WHPA-E (VS = 10) (existing).		Existing: 1 year/ 5 years (T-6)	GEN-1 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 MOECC	E K	**Education and Outreach** 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: 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 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: • WHPA-A (existing, future); or • WHPA-B (VS = 10) (existing, future); or • WHPA-E (VS = 10) (existing, future). Where appropriate education and outreach materials prepared by the Ministry of the Environment and Climate Change 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 MON-4

Policy ID	Threat Description	Implementing Body	Legal Effect	Policy	Where Policy Applies	When Policy Applies	Related Policies	Monitoring Policy
OS-3	**Moderate/ Low Threats** Handling and Storage of an Organic Solvent	Municipality	J	**Specify Action** 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: • WHPA-B (VS < 10) (existing, future); or • WHPA-C (existing, future); or • WHPA-D (existing, future); or • WHPA-E (VS ≥ 4.8 and <10) (existing, future); or • HVA (existing, future); or • SGRA (VS ≥ 6) (existing, future).	See Chapter 5 of the respective Assessment Report	Existing & Future: Consider within 2 years (T-15)	N/A	N/A

ATTACHMENT 4: PROPOSED AMENDMENTS TO POLICY DNAP-1

Table 1: Proposed amendments to policy DNAP-1

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** Where the handling and storage of a DNAPL is, or would be, a significant drinking water threat, the following actions shall be taken: 1) a) The handling and storage of ~~a~~ DNAPLs of a total ~~in any~~ quantity of 250L 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: • WHPA-A (future); or • WHPA-B (future); or • WHPA-C (future); or • WHPA-E ~~(VS = 10)~~ (future). b) The handling and storage of DNAPLs of a total quantity greater than 25L but less than 250L, 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: • WHPA-A (future). c) The handling and storage of DNAPLs of a total quantity greater than 25L but less than 250L, 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: • WHPA-B (future); or • WHPA-C (future); or • WHPA-E (future).	See Maps 2.1 - 2.21	Future: Immediately(T-5)	GEN-1	MON-2
			H	2) The handling and storage of ~~a~~ DNAPLs of a total quantity of 25L or greater ~~in any quantity (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: • WHPA-A (existing); or • WHPA-B (existing); or • WHPA-C (existing); or • WHPA-E ~~(VS = 10)~~ (existing).		Existing: 1 year/ 5 years (T-6)	GEN-1 GEN-2	MON-2

ATTACHMENT 5: PROPOSED AMENDMENTS TO POLICY OS-1

Table 2: Proposed amendments to policy OS-1.

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** Where the handling and storage of an organic solvent is, or would be, a significant drinking water threat, the following actions shall be taken: 1) ~~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 areas: • WHPA-A (future). b) 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 would be significant in any of the following areas:~~; or~~ • WHPA-B ~~(VS = 10)~~ (future).~~; or~~ ~~WHPA-E (VS = 10) (future).~~	See Maps 1.1 - 1.21	Future: Immediately (T-5)	GEN-1	MON-2
			H	2) 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: • WHPA-A (existing); or • WHPA-B ~~(VS = 10)~~ (existing).~~; or~~ ~~WHPA-E (VS = 10) (existing).~~		Existing: 1 year/ 5 years (T-6)	GEN-1 GEN-2	MON-2

ATTACHMENT 6: COMMITTEE REPORT FOR ENDORSEMENT OF AMENDED EXISTING THREAT ACTIVITY DEFINITION, AND TRANSITION AND TIMELINE POLICIES OF THE CTC SPP, FEBRUARY 15, 2022

TO: Chair and Members of the Source Protection Committee Meeting #1/22

DATE: February 15, 2022

FROM: Janet Ivey, Chief Specialist, Watershed Plans and Source Water Protection, Credit Valley Conservation

RE: Endorsement of Amended Existing Threat Activity Definition, and Transition and Timeline Policies of the CTC Source Protection Plan

KEY ISSUE

A proposal to amend the CTC Source Protection Plan definition of *existing threat activity*, transition policy and timelines for policy implementation.

RECOMMENDATION

IT IS RECOMMENDED THAT the CTC Source Protection Committee receive the staff report Endorsement of Amended Existing Threat Activity Definition, and Transition and Timeline Policies of the CTC Source Protection Plan for information;

AND FURTHER THAT the CTC Source Protection Committee endorse amendments to the definition of existing threat activity, and transition and timeline policies, to clarify their applicability to amendments to the CTC Source Protection Plan and update implementation timelines;

AND FURTHER that staff be directed to incorporate the new policy text as part of a forthcoming amendment to the CTC Source Protection Plan, under Section 34 of the Clean Water Act.

REPORT

Background

The *Clean Water Act, 2006* defines a *drinking water threat* as an activity or condition 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. These include activities or conditions that are prescribed by regulation as drinking water threats.

Drinking Water Threats, Existing and Future

To implement the *Clean Water Act, 2006* definition of *drinking water threat*, the CTC Source Protection Plan (SPP) includes a specific definition of an *existing threat activity* to differentiate existing threats from future threats. The SPP applies immediately to all future threat activities and includes timelines for bringing all

current threat activities into compliance with the SPP policies.

Existing Threat Transition Policy and Timeline Policies

The SPP includes a transition policy to clarify under what circumstances policies for existing threats could apply to a planned threat activity that has not yet commenced (i.e., a "future" threat activity that may otherwise be subject to prohibition policies). The purpose of the transition policy is to allow flexibility for activities associated with development proposals that were underway at the time the SPP came into effect (December 31, 2015). Finally, and in addition to the transition policy, the SPP includes a series of specific timeline policies identifying when policies take effect and setting out implementation deadlines.

Discussion

Two situations have arisen since the SPP came into effect that have prompted review of the definition of *existing threat activity* and the timeline and transition policies.

First, the current wording of the definition and policies does not clearly state whether or how they are intended to be applied when new vulnerable areas (e.g., wellhead protection areas) and drinking water threats are identified through an amendment. This issue was raised at the time of the Inglewood amendment (2019) and has not yet been resolved.

As vulnerable areas continue to be added or modified within and near growing urban areas, the potential for subjecting activities associated with an in-progress development application to future threat prohibition policies grows. As a result, the definition of *existing threat activity* and transition and timeline policies should be amended to clarify applicability and implementation deadlines for existing threats newly identified during an amendment.

Second, following a request by the CTC Source Protection Committee in 2020, MECP approved a 3-year extension to the December 31, 2020, deadline to complete risk management plans for existing significant threats. As a result, timeline policy T-6 should be amended.

The CTC Amendments Working Group met in November 2021 to discuss draft revisions to the definition of *existing threat activity* and the timeline and transition policies. Proposed amendments were circulated to the working group and staff at the MECP for review and all comments received were supportive of the amendments.

Proposed Policy Amendments

Attachment A presents proposed "track changes" amendments to the definition of *existing threat activity* and the timeline and transition policies of the SPP. In summary, the proposed amendments:

- Clarify that significant threat activities currently occurring in a new or revised vulnerable area, identified at the time of an amendment, will be subject to existing threat policies.
- Extend application of the transition policy to in-progress development applications in new or revised vulnerable areas identified through an amendment. Amendments to an assessment report resulting in addition or revisions to vulnerable areas are listed in a table.
- Clarify that for "new" existing threat activities added through amendments to an assessment report, timelines for policy implementation that reference the date the SPP takes effect are interpreted to mean the effective date of the amendment.
- Revise policy T-6 to reflect the updated December 31, 2023, deadline for completing risk management plans for existing drinking water threats, and to allow 5 years from the effective date of an amendment to complete risk management plans for "new" existing drinking water threats.

To support the proposed policy amendments, the text of the Explanatory Document will be updated to describe the intent of the amendments and any required clarification.

Members of the CTC Source Protection Committee are requested to endorse the amended policies.

Summary and Next Steps

Pending endorsement of the policy amendments by the SPC, source protection authority staff will prepare edits to the CTC Source Protection Plan and Explanatory Document. This amendment is expected to be made at the time of the next amendment to the SPP under section 34 of the *Clean Water Act*.

Report prepared by:

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Date: February 1, 2022

Attachments: 1

Attachment A: Proposed track changes amendments to CTC Source Protection Plan definition of Existing Threat Activity and transition and timeline policies.

Attachment A: Proposed track changes amendments to CTC Source Protection Plan definition of Existing Threat Activity and transition and timeline policies.

Definitions

Existing Threat Activity

The CTC Source Protection Plan ~~was~~ 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 ~~the day the Source Protection Plan comes into effect~~December 31, 2015.

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 ~~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 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
Toronto and Region Assessment Report	2.0	March 25, 2019	Addition of Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Caledon East Drinking Water System
Toronto and Region Assessment Report	~~2~~3.0	To be confirmed	Updated Wellhead Protection Areas, Vulnerability Assessment and Threats Enumeration for Newmarket-Aurora Drinking Water System

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~~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.

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~~within 5 years from the date the Source Protection Plan takes effect~~*.
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.

Table 10-1: Timelines for Policy Implementation