

From: [protection_source \(MECP\)](#)
To: [mmaacdonald@abca.on.ca](#); [Donna Clarkson](#); [Kelsey Guerette](#); [Ivey, Janet](#); [kstammler@erca.org](#); [Chitra Gowda](#); [mkeller@grandriver.ca](#); [gailw@lakeheadca.com](#); [crystal.percival@mattagamiregion.ca](#); [Laura Cummings](#); [Thomas Proks](#); [David Ellingwood](#); [Amy Dickens](#); [Lisa Van De Ligt](#); [Carl Seider](#); [Marlene McKinnon](#); [Bill Thompson](#); [Madison Keegans](#); [welkerj@thamesriver.on.ca](#); [Keith Taylor](#)
Cc: [mpearson@bmross.net](#); [willj@kos.net](#); [dswright@bell.net](#); [Thomas Fuerth](#); [Bob Edmondson](#); [Wendy Wright-Cascaden](#); [mayor.lucy@tbaytel.net](#); [mayor@timmins.ca](#); [Ken Graham](#); [spcchair@npca.ca](#); [wpb@belterworks.com](#); [Maxwell Christie](#); [raymondbeauregard@hotmail.com](#); [the.ed@rogers.com](#); [Terry Rainone](#); [ldollin@innisfil.ca](#); [qnbmci50@gmail.com](#); [dean_edwardson@outlook.com](#); [jthunt@eagle.ca](#); [DBalika](#); [Corrigal, Kirsten \(MECP\)](#); [Elizabeth Forrest](#); [Mary Wooding](#); [Eby, Catherine \(MECP\)](#); [Lavender, Wendy \(MECP\)](#); [Moulton, Jennifer L. \(MECP\)](#); [CSPB Coordinator \(MECP\)](#); [Jacoub, George \(MECP\)](#); [Sarwary, Ghzal \(MECP\)](#)
Subject: Guidance to support the incorporation of the 2021 Director's Technical Rules in Source Protection Plans
Date: February 15, 2022 12:41:43 PM
Attachments: [Bulletin2_ClimateChange-SourceProtection Considerations_Feb2022.pdf](#)
[Bulletin1_2021TRs-Implementation Guidance_Feb2022.pdf](#)

SENT ON BEHALF OF KIRSTEN CORRIGAL, DIRECTOR, CONSERVATION AND SOURCE PROTECTION BRANCH

Good day, all:

I am pleased to share the guidance materials attached to help support incorporating the 2021 Director's Technical Rules (Rules) into future assessment reports and source protection plans.

The guidance material includes two (2) technical bulletins that help explain:

- the technical specifics behind the amended Rules,
- the approach specified in the Rules to consider climate change risks to drinking water quality, and
- how future updates of source protection plans can incorporate the amended Rules under s.34 and s.36 of the *Clean Water Act, 2006*.

I encourage you to read the Rules in conjunction with the guidance materials to help you prioritize the necessary technical work to address urgent local matters and work plan for the next 2 fiscal years and beyond. The amended Rules may be found here: <https://www.ontario.ca/page/2021-technical-rules-under-clean-water-act>.

If you have any questions on the guidance or the Rules, please contact your Liaison Officer and the technical lead of the Rules, George Jacoub, at George.Jacoub@Ontario.ca.

Sincerely,

Kirsten Corrigal, Director
Conservation and Source Protection Branch

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Bulletin: Implementation of the 2021 Amendments to the Technical Rules under the *Clean Water Act*, 2006.

Date: February 15, 2022



Table of Contents

Introduction	2
1- Purpose.....	2
2- Background.....	2
3- Amendments governing delineation, vulnerability, and risk assessment	3
3-1 Alternative Approach – R15.1:.....	3
3-2 Climate Change – R15.3:.....	3
3-4 Issue Contributing Areas (ICAs) – R16(9), R47(7), R48(7), and R78(1):.....	3
3-5 Intake Protection Zones 1, 2 (IPZ-1, IPZ-2) – R62.1 and R87:.....	4
3-6 Surface Water-Groundwater Connection (connection) – R49 and R49.1:.....	5
3-7 Local Threat – R119:	6
3-8 Contaminated Sites / Conditions – R139 and R141:.....	6
4- Amendments governing the Tables of Drinking Water Threats (Part XII of the Rules)	8
4-1 Added threat sub-categories:	8
4-2 Revised existing threat sub-categories:.....	9
4-3 Clarified existing threat sub-categories:.....	16
4-4 Editorial changes to threat sub-categories:.....	18
5- Incorporation and implementation of the 2021 Rules	18
5-1 Updating assessment reports and source protection plans:	18
5-2 Ministry review of environmental compliance approvals and environmental assessments:.....	20
5-3 2021 Rules and source protection plan policies:	20
6- Additional notes	22
Appendices	23
Appendix A: Threats activities contributing to common drinking water issues:	23
Appendix B: Activities related to the circumstances of threat sub-category 1.13	28

Introduction

The *Clean Water Act, 2006* ("the Act" or "CWA") ensures communities protect their drinking water supplies through prevention by developing collaborative, watershed-based source protection plans that are locally driven and based on science. For additional information on the CWA and how the source protection plans are developed, readers may refer to this web page www.ontario.ca/page/source-protection.

The Act and the General Regulation 287/07 (O. Reg. 287/07) establish a legal framework for drinking water source protection in Ontario. The Director's Technical Rules (Rules) (entitled "Technical Rules: Assessment Reports") are established under Section 107 of the Act and govern the assessment of risks to drinking water sources. The version of the 2021 Rules discussed includes the recent amendments to the Rules. These can be found at this link: www.ontario.ca/page/2021-technical-rules-under-clean-water-act.

Throughout this document, individual rules are referred to by the letter R in combination with the rule number. For example, "R11" means "Technical Rule 11". Similarly, threat categories and sub-categories are referred to by "# [threat number]". For example, "# 1.8" refers to threat # *1.8 Storage of hauled sewage*. This reference number can be found in the tables of drinking water quality threats, now found in Part XII of the Rules.

While every effort has been made to ensure the accuracy of the information in this document, it should not be construed as legal advice or relied on as a substitute for referring to the Act, the regulations made under the Act, and the 2021 Technical Rules.

1-Purpose

The purpose of this bulletin is to provide an overview of the 2021 amendments¹ to the Rules to support understanding and implementation by a local authority (a source protection authority (SPA) or municipality) who is responsible for performing technical work/policy development and or updates to the assessment reports and source protection plans. Understanding these changes will help incorporate them into source protection plans and assessment reports (plans) through the processes outlined in section 34 or section 36 of the Act.

2-Background

The 2021 Rules took effect on December 3, 2021, and aim to:

- Clarify terminology, e.g. impervious surface methodology; naming convention for certain types of vulnerable areas (i.e. issue contributing areas; land setbacks from shore associated with intake protection zones; off-site contamination).
- Clarify the information needed to conduct a water quality climate change risk assessment.

¹ 2021 Rules contain the Tables of Drinking Water Threats in the same document (Part XII). The tables are no longer a stand-alone document.

- Clarify situations where a surface-water-based WHPA-E is to be delineated, i.e. groundwater and surface water interaction can impact water quality at a well (formerly known as Groundwater Under the Direct Influence of Surface Water wells).
- Clarify that the local threats provision intends to address activities that are not provincially or federally regulated and are area or community-specific.
- Update the Tables of Drinking Water Quality Threats (Tables) and integrate them into the Rules as one document.

3-Amendments governing delineation, vulnerability, and risk assessment

The Rule amendments explained in this section apply to any update directed by the Minister's Order under section 36 or amendment initiated by the source protection authority under section 34 of the Act.

3-1 Alternative Approach – R15.1:

R15.1 has been amended to reduce the administrative burden associated with the formal approval of a request to use an alternate method to gather information or perform tasks prescribed in the rules. Amended R15.1 requires the source protection authority or committee to obtain written consent from the Director of the Conservation and Source Protection Branch (CSPB) or any delegated ministry staff before using the alternate approach. This amendment ensures that the local authority has the ministry's concurrence of the alternative approach before pre-consultation and consultation.

3-2 Climate Change – R15.3:

R15.3 has been amended to set out the information required in the assessment report if a climate impact assessment is conducted.

Collaboration between municipalities, source protection authorities/committees, and others is highly recommended to obtain a general consensus to determine if a risk assessment should be conducted and what information should be included in the plan.

R15.3 does not prescribe an approach or a model for conducting the risk assessment, and it is up to the local authority to determine the appropriate tool and process to meet the R15.3 requirements. Refer to the bulletin "Considering Climate Change Impact on Water Quality under the Clean Water Act, 2006" for more information on this topic.

3-4 Issue Contributing Areas (ICAs) – R16(9), R47(7), R48(7), and R78.1:

ICAs are required when a drinking water issue is identified under R114. The 2021 Rules recognise the ICAs as a vulnerable area associated with either surface water or groundwater sources (i.e. IPZ-ICA or WHPA-ICA). These areas would focus on the activities that contribute to the issue meaning

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

the contaminant present in the source water that gives rise to the issue. The IPZ-ICA or WHPA-ICA depends on the delineated WHPA or IPZ and the activities contributing to the issue.

Where an ICA goes beyond WHPAs/IPZs (which may be very rare), there needs to be a connection between the area outside the WHPAs/IPZs and the relevant WHPAs/IPZs. For example, an existing highly vulnerable aquifer (HVA) is connected to the WHPAs, or a transport pathway connects the area to the IPZs.

The Rules require a rationale to support the size of the delineated ICA and evidence supporting the activities identified as contributing to the issue. This evidence can include environmental monitoring data, modelling, analytical mass balance, information about specific activities near the well/intake, etc. This information may be sufficient to delineate an ICA of a particular size/configuration, and when more information is available, the ICA can be updated.

The amended Rules apply when delineating new ICAs or when the local authority decides to re-evaluate an existing ICA's delineation due to new information or data. However, until such a re-evaluation, the existing ICAs remain in effect.

It is recommended that the name of existing ICAs in the source protection plan be replaced to align with the amended terminology in the 2021 Rules so that IPZ-ICAs are used for issue contributing areas related to surface water sources and WHPA-ICA for issue contributing areas related to groundwater sources.

When an ICA is delineated, a list of threat activities that contribute to the issue is to be provided in the assessment report. Appendix A lists threats for the most common issues identified in the first round of planning. If an issue is not included in this appendix, the local authority is requested to contact the ministry to develop an associated list for that issue. In addition, Director's approved local threats circumstances contributing to the issue referenced in appendix A is to be added to the list of threat activities while updating or amending the assessment reports.

Given the new naming convention for ICAs, the WHPA-F identifier is no longer valid. The WHPA-F would be replaced with WHPA-ICA (surface water-based), where the IPZs delineation Rules guide its delineation without a vulnerability score lens. WHPA-F was initially required where a WHPA-E was delineated, and activities contributing to the issue at the well were located beyond the existing WHPAs. Rationale and evidence supporting the delineation of a WHPA-ICA continue to be required in the assessment report. For example, suppose the local authority has information showing that activities contribute contaminants beyond the WHPAs and are transported through surface water bodies. In that case, a WHPA-ICA can be delineated to capture this source.

3-5 Intake Protection Zones 1, 2 (IPZ-1, IPZ-2) – R62.1 and R87:

IPZ-1 is delineated using a fixed radius around the intake and can not exceed the maximum radius. R62.1 has been amended to enable the extension of the setback of IPZ-1 on land and allow the

inclusion of surface water features (e.g. transport pathways) within the maximum radius. The definition of transport pathways in the 2017 Rules applies to all IPZs. R62.1 does not require revisiting all existing IPZ-1 delineations unless existing information indicates the presence of surface water features that may increase the vulnerability of IPZ-1 to contamination, subject to local authority discretion/professional judgement.

Amended R87 addresses situations where an IPZ-2 is very large. The Rules do not prescribe an approach for dividing an IPZ-2 into sub-areas, as this depends on the local characteristics and settings of the drinking water sources. However, the criteria for dividing IPZ-2 into sub-zones could be, for example, based on the slope of the land (steep vs. flat), type of soil (sand vs. silt), or time of travel intervals (30 mins, 60 mins). A multi-score concept would more appropriately reflect the variation of the land characteristics (land slope, permeability, transport pathways, etc.) used to determine the travel time to the intake.

R87 does not require revisiting all existing IPZ-2 scores. Revisiting IPZ-2 scores may identify new risks to drinking water sources as the sub-divided IPZ-2 may yield vulnerability scores that better reflect the local land characteristics. However, if all the new IPZ-2 vulnerability scores would not result in drinking water threats being identified as “significant,” the local authority may choose not to sub-divide IPZ-2 and retain one IPZ-2 with one score.

3-6 Surface Water-Groundwater Connection (connection) – R49 and R49.1:

In previous versions of the Rules, connection identification relied solely on the Groundwater Under the Direct Influence of Surface Water (GUDI) framework under the *Safe Drinking Water Act* (i.e. pathogen driven). Where this connection is identified, the Rules triggered the delineation of a WHPA-E (surface water-based) to capture activities that contribute pathogens to the source water at a well. However, the original purpose of WHPA-E is to capture activities contributing to both pathogens and chemicals through this connection. Therefore, R49 was amended to remove reference to the GUDI procedure to focus on the surface water-groundwater connection.

Under R49, the local authority will need to demonstrate this connection by characterizing the hydrogeological/geological settings, geoscience technical studies, water quality data, etc. That means that the study would have the settings that demonstrate whether there is a connection. For example, connections would typically be part of the hydrogeological assessment completed to bring a new municipal well into service (e.g., Permit to Take Water application). The connection may occur or be enhanced when an operating well draws groundwater and surface water. Typically, an assessment of hydraulic connection relies on the field methods, including pumping tests and analysis (e.g., recharge boundary effects, recovery characteristics, etc.) and an assessment of vertical and lateral hydraulic gradients and flow directions under pumping conditions and with consideration of seasonal effects. However, local authorities may know surface water bodies further afield that could contribute enough persistent chemicals (e.g., chloride, sodium, nitrate, etc.) to

groundwater quality at a well and thus may also warrant assessment. Therefore, it is important to assess the potential for hydraulic connections up to WHPA-B.

If the connection is found and there is insufficient evidence that the connection may adversely affect the quality of drinking water at the well, the WHPA-E will not be required (R49.1). R49 and R49.1 are intended to apply moving forward, i.e. new WHPA-Es. However, it is the local authority's discretion to revisit all existing WHPA-Es identified in the assessment reports.

3-7 Local Threat – R119:

R119 was amended to avoid duplication in efforts between provincial/federal regulations. The intent of the local threats is to address local situations that pose a risk to a drinking water source, a specific drinking water system, or a specific protection zone. They are not intended to regulate activities where they are already regulated under provincial or federal site-specific approval. For this reason, the Rule was amended to disqualify activities from R119 where the activity is subject to an approval requirement under federal or provincial law.

If the local authority is aware of a local drinking water activity that is already regulated by provincial or federal law, and that in the opinion of the local authority there is a gap in managing its drinking water risk through the provincial or federal law, they can bring this to the ministry's attention with a rationale for why the activity needs to be listed as a local threat in the assessment report. The Director will determine whether existing provincial or federal laws can regulate the drinking water threat activity in question. If further actions are necessary, the activity may be identified as a prescribed threat under the O.Reg. 287/07 (e.g. hydrocarbon pipeline). For other non-regulated provincial/federal activities, the local authority may submit a request to the Director to identify the activity in question as a local threat under R119, subject to the Director's review and decision.

Local threats approved before the 2021 Rules were released are not impacted by the amended R119.

3-8 Contaminated Sites / Conditions – R139 and R141:

The 2017 Rules clarified that the intent of significant groundwater recharge areas (SGRAs) was to identify areas vulnerable to water quantity risks. With this in mind, R126 was amended in 2017 to remove references to SGRAs for water quality threats related to conditions. Thus, where conditions were identified in SGRAs, they are no longer water quality threats. Conditions can only be identified in water quality protection zones (e.g. IPZs, WHPAs, or HVAs).

Generally speaking, a condition is identified as an underground plume of contaminant(s). The Rules to identify conditions focus on identifying contamination at the site and whether the plume is migrating and can potentially impact the water quality of the source of drinking water.

R139 and R141 were amended to clarify the intent of the term "off-site contamination" previously used in the 2017 Rules. Conditions are generally identified as plumes of

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

contaminants regardless of the property boundary. When the property on which the contamination originated is known, the local authority can use the property boundary to identify the contamination is migrating outside the property, i.e. similar approach used previously with the term off-site contamination. In other situations, where data is not sufficient to identify the origin of the contamination, evidence would be needed to demonstrate that the plume of contamination has the potential to move towards the well or intake. In this case, the local authority is encouraged to use available information to identify the property(ies) that caused the contamination.

Concerning the term 'evidence' in R139 and R141, read this in conjunction with the second part of sub-rule (1) of R139 or sub-rule (4) of R141, which refers to the potential of the condition to deteriorate water quality. Evidence could include, but is not limited to, situations where:

- the condition is impacting the operation of the well (for example, running at a lower pumping rate or shut down, etc.),
- the plume of contamination is observed to be migrating towards a well or intake at a concentration that may impact the operation of the well/intake (e.g. moving from WHPA-B to A or from IPZ-2 to IPZ-1, etc.), or
- the plume of contamination is not stable (e.g. where equilibrium has not been achieved) or is observed to be increasing over a period of time as demonstrated by groundwater transport modelling and groundwater monitoring data support that.

If there's no clear evidence of how contamination is migrating to the well/intake, the condition would not be a significant drinking water threat in accordance with R139(3), and R141 would not apply.

Information about the movement of contaminants along with other considerations of the current status of the condition (e.g. stable, decreasing, etc.) can also be used by the local authority to re-assess the condition and determine whether it would still be considered a significant threat. That re-assessment could result in a decision to amend the plan and either remove the condition or revise the risk level of the condition.²

² Additional Notes:

- To meet the legal test of s. 22 (2) 2 ii of the Act, which requires that a significant threat policy ensure that an existing significant drinking water threat ceases to be significant, the management and/or monitoring of the contaminated site may be adequate. That does not mean that the circumstances that define the risk have changed but rather that the site is being managed.
- The Records Of Site Condition regulation made under the *Environmental Protection Act* (O. Reg. 153/04) sets out the requirements for environmental site assessments and records of site conditions for contaminated sites, also known as brownfields. Where a Risk Assessment and/or Certificate of Property Use is issued for a condition site under O. Reg. 153/04, these documents may describe the risk management measures to contain contaminants on the site. In addition, the local authority can report on the management of the significant condition in their annual progress report.

4-Amendments governing the Tables of Drinking Water Threats (Part XII of the Rules)

The Tables of Drinking Water Threats (Tables) have been merged with the 2021 Rules (Part XII) to simplify identifying the threat and associated circumstances. This new structure allows for an easier and more focused search to identify risks associated with each prescribed threat. Key features include:

- Alignment of the threats number with the numbering system in the Act and Regulation 287/07.
- Inclusion of 'C' and 'P' to the circumstance numbering system represents whether the circumstance is either chemical or pathogen.
- Combining the threat sub-categories of handling and storage for the same threats to recognize their combined risks on property.
- Reformatting the circumstances to remove chemicals showing where threats can pose risks; however, chemicals associated with circumstances were embedded in calculating the hazard ratings for each activity.
- Displaying both chemical and pathogen circumstances associated with a threat sub-category in the same table.
- Listing the threat activities associated with the most common drinking water issues to support identifying significant drinking water threats in ICAs (see appendix A).

The sub-sections below summarize the changes made for specific threat sub-categories. Threats and circumstances not included in these sub-sections remain unchanged from the previous versions of the tables. The threat sub-category is referred to in the following sections as "# [threat number]." This reference number can be found in Part XII of the Rules.

4-1 Added threat sub-categories:

The threats sub-categories included under this section are:

- i. *Application of processed organic waste (POW) to land (threat # 1.2) and storage of POW or waste biomass (threat # 1.9):*

To better align the threat categories with the provincial management frameworks, new threat sub-categories have been added:

- the land application of POW
- the storage of POW and waste biomass.

POW material is the organic waste residue remaining after sewage treatment plant processing and is similar to a category 3 non-agricultural source material (NASM). Under the provincial management frameworks, the land application and storage of POW are subject to an Environmental Compliance Approval (ECA) under the *Environmental Protection Act* (EPA) when applied on non-agricultural land. When POW is applied on agricultural land as NASM, land application and storage are subject to the *Nutrient Management Act* (NMA). Where POW is

stored on an agricultural property for disposal and does not meet the category 3 land application requirements under the NMA, the POW storage and disposal would be subject to the EPA. POW can either be disposed of in municipal landfills or applied to sites that are not municipal landfills. Like the nutrient application threats, the risks related to POW application are determined based on the percentage of managed land and livestock density for the area.

Waste biomass is the organic matter derived from a plant or animal available on a renewable basis, as defined under O. Reg. 347 under the EPA. It is similar to several NASM materials. The generation and storage of waste biomass off-farm are subject to the EPA unless sent to an anaerobic digestion facility defined in Section 3(1) 14 of O. Reg 347. When the waste biomass is applied on agricultural land as NASM, the land application and storage are subject to the NMA. If the waste biomass is not sent to anaerobic digestion facilities but rather disposed of, this material is considered municipal waste and disposed of in municipal landfills.

The risks associated with the storage of POW or waste biomass are calculated based on the mass of nitrogen as a surrogate for nitrate and the type of storage (i.e. at, above, or below grade). Threats under the POW, application and storage sub-categories can be addressed by prescribed instrument (PI) policies. The ministry has been and will continue to consider the protection of drinking water sources when reviewing, issuing and reporting on applications for ECAs for POW, regardless of whether plan policies for NASM specify that they also apply to POW. Local authorities should review their NASM policies in their source protection plans to determine whether they have already captured the application and storage of POW. Where such policies do not address the application and storage of POW off-farm, local authorities can choose to amend the existing NASM policies or create new policies for these sub-categories at the next amendment under sections 34 or 36 of the Act.

ii. *Storage of hauled sewage (threat # 1.8):*

This sub-category is mainly associated with stationary storage and does not include septic tanks or septic systems where the sewage is produced before hauling. The risks related to the application of hauled sewage are defined in the threat tables; however, the tables did not capture the risk associated with the stationary storage where the hauled sewage is stored temporarily by haulers where it is not generated or disposed. Therefore, a local authority should consider updating the policies in a source protection plan where needed to reflect these new sub-categories at the time of the next amendment under sections 34 or 36 of the Act.

4-2 Revised existing threat sub-categories:

The following threats have been amended to clarify the risk associated with each threat:

- i. *Transfer/processing sites approved to receive hazardous waste or liquid industrial waste (threat # 1.10) and Transfer/processing sites approved to receive only municipal waste (threat # 1.11)*³:

Threat # 1.10 includes sites approved to receive subject waste (i.e. hazardous waste and liquid industrial waste (LIW) defined under Part V of the EPA). Threat # 1.11 includes sites that can only accept municipal waste, including residential, commercial, institutional, and industrial non-hazardous wastes.

Specific quantities are listed in clauses (p), (q), (r), (s), (t), or (u) as exemptions to the definitions of “hazardous waste,” and clause (d) of the definition of “liquid industrial waste” in O. Reg. 347 under the EPA. These are known as small quantity exemption (SQE) wastes. The storage of SQE wastes, where generated on-site, was identified as a risk under the 2017 Rules. However, these quantities do not pose a risk at the generating site or facility, but rather when they are accumulated at a municipal waste transfer/processing site (i.e., Threat # 1.11). Therefore, the SQE wastes would not be identified as a risk under threat sub-category # 1.10 because these sites are approved to receive subject wastes; however, under the threat sub-category # 1.11, the storage of SQE wastes would be identified as a risk since they are managed under the municipal waste stream (which are not approved to accept subject waste).

The amended descriptions for the risks associated with these threat sub-categories consider the storage location of the wastes at the transfer/processing sites (i.e., whether the storage is at, above, or below grade).

Refer to section 5 for additional considerations when reviewing Risk Management Plans (RMPs) established to manage the SQE wastes under the 2017 Rules.

- ii. *Storage of subject waste at a waste generation facility: site requires generator registration under Section 3 of O. Reg. 347 (threat # 1.12):*

The Waste Management regulation made under the EPA (O. Reg. 347) sets out the provincial waste management framework. It specifies which hazardous waste and LIW generation facilities require ECAs, which facilities require registration, and those subject to other measures. For example:

- All products containing mercury are categorized as "common mercury waste" under O. Reg. 347. Common mercury waste can be transported to a common mercury recovery facility without generator registration or transportation manifests.
- Waste electrical and electronic equipment (widely known as WEEE) that is collected and transported by a hauler to the electrical and electronic equipment (EEE) collection site is managed under O. Reg. 522/20 (Electric and Electronic Equipment) under the *Resource Recovery and Circular Economy Act, 2016*.

³ Both Threats #1.10 and #1.11 address storage of waste.

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

Some facilities generating and storing hazardous waste or LIW (i.e., subject waste) do not require an ECA. Instead, they only require registration under the Hazardous Waste Information Network (HWIN). "Subject waste" is a term that refers to hazardous waste (including hazardous waste treated to remove characteristic hazards such as reactivity and ignitability) and LIW that is to be registered with the MECP through the HWIN. The transport of these wastes is to be tracked through HWIN. Therefore, threat sub-category # 1.12 includes storage of commercial, institutional, and industrial facilities at the original generators of subject waste until these wastes have been treated to meet the land disposal treatment requirements (LDRs). This storage does not require an ECA, although O. Reg. 347 includes provisions to manage the temporary storage of subject wastes on these sites. Since these waste generators do not require ECAs, the *Clean Water Act, 2006* allows local authorities the ability to require Risk Management Plans (RMPs) for these activities. Refer to section 5 for additional considerations when reviewing RMPs established under the 2017 Rules to manage waste storage at generating sites requiring registration.

iii. *Storage of Waste at a Waste Generation Facility: site that is exempt or excluded from generator registration requirements (threat # 1.13):*

Like # 1.12, threat sub-category # 1.13 includes facilities that are the original generators of hazardous wastes or LIW. However, unlike # 1.12, these facilities do not require ECAs or registration under HWIN. The management framework of these wastes is found in other EPA regulations. Since these facilities are the original generators of hazardous wastes or LIW and require neither registration nor an ECA, a source protection plan may include policies that rely on Part IV of the Act to manage or prohibit activities that meet the circumstances for threat sub-category # 1.13. Appendix B provides a list of activities that would meet these circumstances.

The circumstances for threat sub-category # 1.13 do not include the storage of *municipal* waste; therefore, they also do not include the storage of SQE waste (as defined above) since SQE waste is managed under the municipal waste stream only. Refer to section 5 for additional considerations when reviewing RMPs established under the 2017 Rules to manage the storage of waste at generating sites that do not require registration.

Notes: Storage of Waste Oil and DNAPLs

- Waste oil is a common waste product that may be found in facilities where subject waste is generated and stored. In some cases, waste oils can include used DNAPL products, and the threat categories for waste disposal and the storage of DNAPLs may appear to overlap. However, the risks related to waste oil and DNAPLs are assessed separately under two different threat categories in the Tables. The threat category for DNAPLs captures unused products only. Once the DNAPL liquid is used and mixed with other chemicals or oils, it becomes waste oil and is considered hazardous waste or LIW. When stored in quantities

above the small quantity exemptions, the storage of used DNAPL products mixed with waste oil is included under the storage of subject waste regulated under O. Reg. 347 (threat sub-category # 1.12).

- However, the circumstances for threat sub-category # 1.13 apply to waste oils produced by retail motor vehicle service stations or service facilities with a written agreement for the collection and management of their wastes with a waste management system that has a waste ECA to haul the hazardous waste or LIW off-site.

Plans are to be revised to reflect the changes to this threat sub-category at the next plan update. Policies to manage significant drinking water threats related to threat sub-categories # 1.12 and # 1.13 can use various tools, including RMPs, specify action, and education and outreach.

iv. *Storm water management facilities and drainage system outfalls (threat # 2.3):*

These facilities receive storm water from contributing areas within geographical areas associated with certain land uses (i.e. commercial, industrial, residential, rural). The quality of the storm water (type of contaminants) depends on the types of land uses that drain into the facility and the size of the impervious surface areas that generate the runoff transported through storm sewers or other transport pathways. Therefore, the circumstances have been amended in the tables to use the percentage of impervious surface areas and the type of land uses to evaluate risks. For this set of circumstances, it is specified that the risk related to storm water management facilities is either the outfall or discharge point of the facility (e.g. storm water management pond) or drainage system (storm sewer discharging to surface water bodies) where it discharges into an IPZ or a WHPA.

The term 'predominant', concerning land use type, has been changed from the previous versions of the tables as it is still relevant to the evaluation of risk associated with this threat sub-category. The local authority can specify the definition of 'predominant' when identifying threats. For example, the local authority may specify that to be considered 'predominant,' a type of land use within the contributing area of storm water area may represent 30-50% or greater of the total contributing area.

Important notes:

- Greenhouses are not included with industrial land uses under the circumstances but rather grouped with agricultural land use.
- The storm water management facilities and drainage system outfalls included in this threat sub-category require ECAs under the EPA and therefore cannot be addressed by policies under Part IV of the Act, meaning that they cannot be managed by RMPs under section 58.

v. *Storm water infiltration facilities (threat # 2.4):*

Similar to threat # 2.3, these facilities are a subset of the storm water management facilities that manage storm water, and they are designed to infiltrate storm

water to the ground (including some types of Low Impact Development (LID) facilities). Therefore, they may pose risks to groundwater (in WHPAs). During extreme weather conditions, these facilities may overflow their designed capacity and discharge to land or exfiltrate storm water through perforated pipes; therefore, they may also pose risks to surface water (in IPZs).

To estimate the quantity of water draining to the facility, the circumstances require the sum of the contributing areas of all infiltration facilities installed on a site to evaluate the risk rather than the contributing area of each infiltration facility. The purpose of the infiltration facilities is to collectively manage the total runoff generated on a site through infiltration and exfiltration together with other types of LIDs (e.g. LIDs that promote storage for evaporation). In principle, infiltration facilities installed on a site or within a specific geographic area work together and can vary in size and contributing areas. Separating and evaluating the risk related to each storm water infiltration component on a site rather than the geographic area would be challenging and would not characterize the risk to groundwater properly.

Facilities identified as threats in this sub-category require ECAs, therefore plan policies only apply to storm water infiltration facilities managed by ECAs. Other infiltration facilities, such as vegetated strips associated with agricultural operations regulated under the NMA and that are not subject to ECAs, are not included in this threat category. Policies to manage significant drinking water threats related to storm water infiltration facilities can use a wide range of tools, including prescribed instruments, specify action, and education and outreach.

vi. *Application of road salt (threat # 12):*

To identify the risk associated with this threat, two components are needed:

- 1) the thresholds for low, moderate, and significant risks and
- 2) the grid/area size where the circumstances would apply.

For 1), the circumstances to use lower (new) thresholds have been amended to address situations where the previous thresholds did not identify areas where activities were significant threats, despite the quality of drinking water at the well or intake showing impacts from road salt. These lower thresholds represent the approximate percentage of impervious surface areas in the entire WHPA or IPZ associated with the wells or intakes where road salt had been identified as a water quality concern/issue. These thresholds would apply to all existing and new or expanded drinking water systems; see section 5 for more details.

For 2), sub R16 (11) has been amended to no longer require the use of the 1km x 1km grid to meet the requirement of mapping impervious surface areas. The requirements were removed for using this grid size because, in some situations, it did not accurately identify the areas where road salt posed significant risks.

The rules do not prescribe an approach for choosing the size of the area or sub-area since land characteristics, type of land use, and hydrological settings of the protection zones may vary

from one drinking water system's vulnerable area to another. The amended sub R16 (11) provides the flexibility to the local authority to determine the grid or area size where road salt poses a risk to the quality of water. Grid and area size should be chosen to reflect how various characteristics of the vulnerable areas associated with the drinking water sources would respond to the road salt impacts. For example, the area size could include the entire vulnerable area (i.e. IPZ-1, IPZ-2, or WHPA-A, WHPA-B) that has a single score or the areas that have the same land characteristics (slope, type of soil, etc.) within a vulnerable area. If the local authority chooses to change the 1km x 1km grid to a new grid or a size of an area, the assessment report has to include a description and rationale of the approach chosen.

Under sub R16 (11), a local authority can keep the existing 1km x 1km grid as shown in the assessment reports where, for example:

- the existing grid is sufficient to identify road salt concerns/threats, or
- the threat activity is already identified through other approaches (e.g. ICA), and therefore a different grid /area size will not add a benefit, or
- the vulnerability score(s) of the vulnerable area is not high enough to identify significant threats regardless of the grid/area size.

The new thresholds could still apply within the existing 1km x 1km grid despite the above. The term "impervious areas" used in the circumstances refers only to the areas where road salt is applied, i.e. does not include roofs or backyards.

vii. *Handling and Storage of Road Salt (threat # 13):*

Similar to the threat category for the application of road salt, the quantity thresholds associated with identifying threats related to storage and handling of road salt were not suitable to identify significant risks in all situations. These thresholds didn't account for many areas (parking lots, commercial plazas, etc.) storing smaller quantities of road salt where road salt had been identified as a water quality concern/issue. The circumstances were amended for this threat to account for three types of road salt storage based on their exposure to precipitation. Those are: uncovered storage (full exposure), partially covered storage (potential exposure), and covered storage (very limited to no exposure). The circumstances listed under threat # 13 describe the differences between these.

- For uncovered storage (# 13.1), the minimum quantity threshold for significant threats is 10kg depending on the vulnerable area scores. This quantity represents the average size of storage of road salt in residential, small retail plazas, parking lots, and small yards.
- For partially covered storage (# 13.2), the minimum quantity threshold is 100kg, which represents the average size of containers stored at mall parking lots or other large parking lots or yards.
- For covered storage (# 13.3) inside an area, facility, or structure where the storage or (un)loading is roofed, walled, with an impermeable floor, since they have a very low

likelihood of contributing contaminants to the drinking water sources they would not be identified as significant threats using vulnerability scores. However, they may be identified as significant threats where they are located in ICAs associated with salt issues where the circumstances are met.

Because of the lower thresholds, new areas where significant threats for threat categories # 12 and # 13 could occur may be identified. The local authority can choose to address these newly identified areas using the same or different policy approaches/tools previously used to manage these threat sub-categories in their plan. For example, where a plan includes a prohibition policy for a specific quantity of road salt based on the old threshold, the authority may choose to keep that policy and develop new policies to either prohibit or manage smaller volumes. Policies to manage significant drinking water threats related to road salt can use various tools, including RMPs, specify action, and education and outreach.

viii. *Storage of snow (threat # 14):*

The snow storage threat category includes a snow disposal facility or disposal area designed to receive snow for retention and control or further discharging or infiltrating the meltwater to ground, land, surface water, or sewage works. Snowbanks or ploughed snow in residential areas are not included.

The storage of snow below grade was removed as a circumstance for this threat category since this type of storage hasn't been identified anywhere in Ontario. Additionally, the surrogates used to assess the risk associated with the storage of snow are based on the most common contaminants found in the accumulated snow from specific land use (e.g. commercial or industrial), as well the size of the area where snow is stored. The approach used to quantify the size of the area where stored snow poses a risk to drinking water is similar to the storm water infiltration facilities (threat # 2.4) threat sub-category for consistency. For the use of the term 'predominant,' refer to section 4-2(iv) above.

Storage of snow designed to discharge to the environment requires an ECA. The outfall from the snow disposal facility represents the risk to sources of drinking water. Where an ECA is required, plan policies cannot use either section 57 prohibition or section 58 risk management plan to address this activity.

Other policy tools may be used for the storage of snow that does not require an ECA. Risk management officials (RMO) can use Access Environment Ontario to determine whether a stormwater management ECA exists for a site. For example, that could be done by zooming in on the area where significant risks can exist and extracting the ECAs within that area only. If a stormwater management ECA does not exist for a site, the RMO may investigate further to determine whether the activity requires an RMP.

ix. *Handling and storage of fuel (threat # 15):*

The two sub-categories of handling and storage of fuel have been merged into one set of circumstances since they happen hand in hand on a property. Part XII.1 (glossary) of the Rules clarifies that storage of fuel includes the handling process associated with the storage although they may not necessarily take place at the same grade level of the property, hence the water quality risks of storage and handling may be different. For example, where the storage is below grade, and the handling takes place above grade, each handling and storage risk is assessed using the below and above grade circumstances, respectively. Additionally, the circumstances have been revised to recognize the risk related to the above grade handling and storage of fuel in quantities of 250L or greater in a groundwater protection zone (WHPA) with a vulnerability score of 10.

The evaluation of the risk associated with this threat activity is focused on permanent tanks/structures where fuel is stored. This includes trucks used as fuel filling stations and does not include mobile containers. However, when temporary containers can stay for an extended period (years), the local authority/municipality can follow the same approach used in the first round of planning for consistency.

The risk associated with this threat is usually determined by the size of a single tank on the site; however, if there is clear evidence that a spill of fuel may occur simultaneously from multiple tanks on the site, then the total storage of these tanks, as one volume, should be used in assessing the risk. In this case, the plans should include an explanation.

When updating plans, policies that used general language, such as "policy applies where the threat is significant," would not require a change to address new threats due to the new thresholds. However, where existing policy wording specifies the storage size, the policy would need to be revised, or an additional policy could be developed to address the new circumstances.

4-3 Clarified existing threat sub-categories:

The threats addressed in this section remain the same as in the existing 2017/2018 tables of threats; however, the circumstances have been amended to clearly identify the parts, facilities, and structures associated with the activities that pose a risk to sources of drinking water.

i. *Wastewater collection facilities and associated parts:*

- Sanitary Sewers (*threat # 2.5*): explicitly identify the forcemain or rising main as the facilities that pose a higher risk.
- Outfalls (*threat # 2.6*): identify the facilities posing risks, e.g. discharge of a combined sewer overflow or sanitary sewer overflow from a manhole or sanitary sewage pumping station overflow from a wet well.
- Sewage pumping station/lift station from a wet well and holding tank or a tunnel: (*threat # 2.7*): risks associated with the leakages to groundwater and surface water.

ii. *Wastewater treatment facilities and associated parts (threat # 2.8):*

The circumstances to separate the following sub-categories have been amended:

- Effluent (including bypass) overflow from the sewage treatment plant.
- Sewage lagoon as a wastewater treatment facility where a discharge to groundwater may occur.
- Process and holding tanks associated with the wastewater treatment facility that may discharge or spill to groundwater or surface water.

iii. *Application of NASM to Land (threat # 6) and storage of NASM (threat # 7):*

Circumstances for these threats now explicitly list the type of NASM categories that pose a risk to water quality and align with recent amendments to the NMA. These categories are:

- category 1 NASM (non-farm herbivorous animals only),
- category 2 (material listed in Schedule 4, Table 2 of O. Reg. 267/03. For example, organic waste matter containing no meat or fish and is derived from food processing at a bakery, etc.), and
- category 3 (material listed in Schedule 4, Table 3 of O. Reg. 267/03. For example, pulp and paper biosolids, etc.).

The application and storage of material from non-farm herbivorous animals (category 1 NASM) does not require NASM plans, unlike categories 2 and 3. Where this activity is identified as a significant threat, local authorities may develop plan policies to address the activity through other tools, including RMPs or education and outreach. Definitions for these NASM categories are provided in the glossary section in Part XII.1 of the Rules.

iv. *Handling and storage of commercial fertilizer (threat # 9):*

The circumstances for this threat have been simplified to focus on the sites where handling and storage of fertilizer may occur. These sites include but are not limited to retail, wholesale, manufacturing facilities, and storage associated with the application of commercial fertilizer. Also, the circumstances include liquid, solid, powder, or any other forms of commercial fertilizer. Mixing and mobilising of commercial fertilizer within a property are identified as threats under the handling sub-category while transporting fertilizer off the property on roads or highways is not included under this threat sub-category.

v. *Handling and storage of pesticides (threat # 11):*

The circumstances related to the type of storage and material form used to describe the handling and storage of pesticides have been clarified to be consistent with those of the handling and storage of commercial fertilizer. The quantity thresholds or the vulnerability scores have not changed.

vi. *Handling and storage of DNAPL (threat # 16):*

The circumstances have been amended to identify DNAPL activities as significant drinking water threats in IPZs scored 9 and 10 instead of only those scored 10. The

tables now recognize that DNAPL chemicals with a high toxicity rating may impact surface water bodies where new areas where significant threats could occur may be identified.

Additionally, a list of activities (List 1), adapted from O. Reg. 153/04 (Records of Site Conditions, also known as the brownfields regulation) where DNAPLs may be stored or handled as part of their operations, have been added. The list of activities is intended to be used to identify activities that likely use DNAPLs instead of attempting to identify specific liquids that exhibit DNAPL characteristics and behaviour in the environment.

List 1 is meant to be used as a guide for the local authority, and its use is optional. The list can be used, in addition to the methods and the local knowledge that were originally used by the local authority to identify significant drinking water threats related to DNAPLs. The list does not limit the local authority from adding other activities to their local list of DNAPL activities. The list is not intended to change the policy approaches implemented in the first round of planning.

Refer to section 4-2 (iii) above to understand the differences between risks associated with waste oil and DNAPL storages.

4-4 Editorial changes to threat sub-categories:

i. *Conveyance of a liquid hydrocarbon by a pipeline (threat # 22):*

The name of the *National Energy Board Act* has been replaced with *Canadian Energy Regulator Act* to align with the name change in that Act in 2019. This change does not affect the risk scores nor the circumstances describing the risk. Also, a definition of liquid hydrocarbon is provided in the glossary of Part XII.1 of the Rules to align with the definitions of pipeline in other provincial regulations and ensure consistency with the previous Director's letters approving local threats for pipelines.

5-Incorporation and implementation of the 2021 Rules

The purpose of this section is to discuss the incorporation of the 2021 Rules into assessment reports and source protection plans, as well as how these changes can be implemented.

5-1 Updating assessment reports and source protection plans:

Local authorities can revise source protection plans and assessment reports to incorporate the 2021 Rules using one or more of these methods:

- an amendment under section 51 of O. Reg. 287/07 for changes in terminology
- a locally initiated amendment under section 34 of the Act
- an update resulting from the review under section 36 of the Act

The most appropriate method depends on factors such as whether the local authority has already completed their Plan review under section 36, whether they have a section 34 amendment underway, and whether any of the changes to the Rules impact their Plans. In all cases, the Plans

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

should indicate which version of the Rules applies to a particular amendment or section of an updated assessment report or source protection plan.

i. *Amendments under section 51:*

In 2018, changes to O. Reg. 287/07 allowed this type of amendment to Plans to address changes in terminology used in the Tables of Drinking Water Threats (see subsection 51 (1), paragraph 9). If an amendment is made under section 51, the SPA will publish the amendment and a notice describing the amendment on the internet as soon as reasonably possible after the amendment is made. The SPA will also give a copy of the notice to the Director and every person or body responsible for implementing a policy affected by the amendment and provide updated geospatial mapping data to the ministry (where applicable). The SPA will record the rationale for the amendment and keep it on file.

ii. *Amendments under section 34:*

Section 34 amendments are typically those with some urgency, usually to address new or changing municipal sources of drinking water. Local authorities may choose this method to incorporate the 2021 Rules into their Plans if they have already completed their plan review under section 36 or if they are in the early stages of preparing an amendment under section 34 and including these additional changes would align with that work. When updating the assessment report, any new work included in the report will be subject to the Rules in effect at the time of the update (including the Tables of Drinking Water Threats).

If a locally initiated amendment is proceeding under section 34 of the Act for a specific purpose before the completion of their Plan updates under section 36, such as to include a new or changing drinking water system, local authorities may want to amend other sections of their plan to incorporate the 2021 Rules if they feel those changes are necessary at the time of the amendment. It is advisable for the local authority to consider the impact of using two or more versions of the Rules in an area that would be subject to source protection plan policies. For example, if you add a new intake protection zone, and you add the activities that would be significant drinking water threats according to the 2021 Rules, you may have activities such as the application or storage of road salt identified as significant in the new vulnerable area, but not in other vulnerable areas. Therefore, the local authority may decide to revise the entire plan to incorporate that aspect of the 2021 Rules, depending on the timelines for their plan updates under section 36.

The local authority can choose to make revisions under section 51 alone or in combination with an amendment under section 34 or 36 of the Act, depending on which aspects of the 2021 Rules impact their Plans. For example, simple changes to terminology in Plans could be made immediately, and more complex changes included in an amendment under section 34. Local authorities may also choose to update their source protection plan to incorporate the 2021 Rules through a series of amendments under section 34, rather than a single amendment, to

prioritize any items that should be addressed quickly.

iii. *Amendments under section 36:*

Updates to the plans made under section 36, including those required by the Minister's order and any additional updates by the local authority, are to align with the Rules in effect at the time of the updates. Local authorities should review the changes to the Tables of Drinking Water Threats (see section 4 above) and assess which changes to the Rules affect their updates.

Where a local authority has already completed a review of their plan under section 36, they should assess the work needed to align their plans with the 2021 Rules. Local authorities can then develop one or more amendments under section 34 to distribute the work over time, starting with the highest priority changes. If the authority determines that only terminology changes are necessary to align with the Rules, those changes can be made under section 51 of O. Reg. 287/07.

If the 2021 Rules take effect while the local authority is nearing completion of their updates under section 36 (i.e. have completed or nearly completed a consultation on these updates), they can choose to align their updates with the 2021 Rules, or complete them "as is," and make the remainder of the changes as an amendment. The local authority is encouraged to discuss this with the ministry before making this decision.

5-2 Ministry review of environmental compliance approvals and environmental assessments:

When reviewing applications for new environmental compliance approvals (ECA) or amendments to existing ECAs, the ministry applies the Rules in effect at the time the application is received whether or not the source protection plan has been updated to reflect the 2021 Rules. The ministry developed Standard Operating Policies (SOPs) to implement source protection plan policies related to sewage and waste and provide minimum design and operational standards and considerations to mitigate risks to sources of drinking water. A summary of the SOPs was posted on the Environmental Bill of Rights Registry (EBR) in 2014. These documents are available by searching the current Environmental Registry of Ontario (ERO) website using the search tool, using ERO #012-2968.

The ministry also reviews documents submitted through various processes under the *Environmental Assessment Act* and applies the Rules in effect at the time the documents are submitted.

5-3 2021 Rules and source protection plan policies:

Local authorities need to assess the impact of changes to the Rules on their threat enumeration and policies. This includes determining whether activities that were significant under the 2017 Rules will continue to be significant under the 2021 Rules. For example, some occurrences of the waste disposal threat sub-categories are no longer significant drinking water threats (certain types of waste (including subject waste) stored at or above grade at a waste generation facility). Some of

these wastes were previously identified as the small quantity exemption hazardous waste sub-category (SQE wastes) described above. This means that policies in source protection plans that address the previous SQE hazardous waste sub-category may need to be reviewed, revised or removed. In addition, since prohibition is the most restrictive policy outcome available under the Act, as per ss.40 (2), para 2, of O.Reg. 287/07, the committee is to include a rationale in the explanatory document to justify why it was selected for a particular threat activity. Similarly, given education and outreach is the least restrictive policy approach, where it is the only policy tool used to address a significant drinking water threat, as per ss.40 (2), para 6, of O.Reg. 287/07, the committee is to include supporting rationale in the explanatory document.

i. *Part IV policies and RMPs:*

Since certain activities may no longer be significant drinking water threats under the 2021 Rules, local authorities and RMOs need to work together to consider how these changes may impact existing and future RMP holders. This includes identifying any existing RMPs that may need to be amended or revoked. RMOs do not need to wait for the plans and assessment reports to be amended before revoking or amending RMPs that are no longer required under the 2021 Rules.⁴ In addition, RMOs should not issue new RMPs for an activity that is no longer a significant drinking water threat under the 2021 rules, even if it is identified as one in the current plan.

Note: RMOs cannot amend or establish RMPs for activities that become new significant threats because of the 2021 Rules until after the plan itself has been amended to align with the Rules, and it takes effect.

ii. *RMPs and registered/unregistered waste:*

With respect to identifying facilities that meet the circumstances for threat sub-categories # 1.12 and # 1.13, RMOs may consult the Hazardous Waste Information Network (HWIN) registry to identify facilities that are registered. The RMO could then inspect and ask whether the generator has an ECA. An ECA is required for a facility that generates subject waste if the subject waste is stored for more than 24 months, regardless of the amount of subject waste stored, whether the facility has the same owner as a waste management system, or whether waste management is a primary function of the site. Threat sub-category 1.12 doesn't include landfills and transfer sites; those facilities require ECAs and are included in separate threat sub-categories. As a reminder, RMOs may only establish risk management plans for activities that *do not* require ECAs.

⁴ While there is no provision in the *Clean Water Act, 2006*, that explicitly addresses an RMO's powers to revoke RMPs, section 49 of the *Legislation Act, 2006*, does include such a provision for all instruments ("documents") made under an Act in Ontario. Therefore, s.49 of the *Legislation Act* is what gives RMOs the legal authority to revoke RMPs (instruments), where deemed necessary.

6-Additional notes

Where new drinking water threat policies are included in source protection plans as a result of the 2021 Rules, local authorities are reminded to include monitoring policies if and where appropriate. Where existing drinking water threat policies are revised due to the 2021 Rules changes, local authorities should also review accompanying monitoring policies, if any, to ensure they still identify what is to be reported on by implementing bodies.

Contact:

Conservation and Source Protection Branch

Source.protection@ontario.ca

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

Appendices

Appendix A: Threats activities contributing to common drinking water issues:

Threat Sub-Category	Quantity threshold for significant threat
Parameter: Chloride	
2.1 Industrial Effluent Discharges	Any quantity for IPZs/WHPA-Es and WHPAs
2.3 Storm Water Management Facilities and Drainage Systems: Outfall from a Storm Water Management Facility or Storm Water Drainage System	Any quantity for IPZs/WHPA-Es and WHPAs
2.4 Storm Water Management Facilities and Drainage Systems: Storm Water Infiltration Facility	Any quantity for IPZs/WHPA-Es and WHPAs
12.1 Application of Road Salt	Any quantity for IPZs/WHPA-Es and WHPAs
13.1 Handling and Storage of Road Salt - Exposed to Precipitation or Runoff	Any quantity for IPZs/WHPA-Es and WHPAs
13.2 Handling and Storage of Road Salt - Potentially Exposed to Precipitation or Runoff	Any quantity for IPZs/WHPA-Es and WHPAs
13.3 Handling and Storage of Road Salt – Not Exposed to Precipitation or Runoff	Any quantity for IPZs/WHPA-Es and WHPAs
14.1 Storage of Snow on a Site	Any quantity for IPZs/WHPA-Es and WHPAs
Parameter: Nitrogen	
1.1 Disposal of Hauled Sewage to Land	Any quantity for IPZs/WHPA-Es and WHPAs
1.2 Application of Processed Organic Waste to Land	Any quantity for IPZs/WHPA-Es and WHPAs
1.4 Landfilling (Hazardous Waste or Liquid Industrial Waste)	Any quantity for IPZs/WHPA-Es and WHPAs
1.5 Landfilling (Municipal Waste)	Any quantity for IPZs/WHPA-Es and WHPAs
1.8 Storage of Hauled Sewage	Any quantity for IPZs/WHPA-Es and WHPAs
1.9 Storage of Processed Organic Waste or Waste Biomass	Any quantity for IPZs/WHPA-Es and WHPAs
1.14 Storage, Treatment and Discharge of Tailings From Mines	Any quantity for IPZs/WHPA-Es and WHPAs
2.1 Industrial Effluent Discharges	Any quantity for IPZs/WHPA-Es and WHPAs
2.2 Onsite Sewage Works	Any quantity for IPZs/WHPA-Es and WHPAs
2.3 Storm Water Management Facilities and Drainage Systems: Outfall from a Storm Water Management Facility or Storm Water Drainage System	Any quantity for IPZs/WHPA-Es and WHPAs
2.4 Storm Water Management Facilities and Drainage Systems: Storm Water Infiltration Facility	Any quantity for IPZs/WHPA-Es and WHPAs
2.5 Wastewater Collection Facilities and Associated Parts: Sanitary Sewers	> 250 m ³ /day for IPZs/WHPA-Es Any quantity for WHPAs
2.6 Wastewater Collection Facilities and Associated Parts: Outfall of a Combined Sewer Overflow (CSO), or a Sanitary Sewer Overflow (SSO) from a Manhole or Wet Well	Any quantity for IPZs/WHPA-Es > 250 m ³ /day for WHPAs

Ministry of the Environment, Conservation and Parks

Conservation and Source Protection Branch

2.7.1 - 2.7.5 Wastewater Collection Facilities and Associated Parts: Sewage Pumping Station or Lift Station Wet Well	> 250 m ³ /day for IPZs/WHPA-Es Any quantity for WHPAs
2.7.6 - 2.7.10 Wastewater Collection Facilities and Associated Parts: a Holding Tank or a Tunnel	> 250 m ³ /day for IPZs/WHPA-Es Any quantity for WHPAs
2.8 Wastewater Treatment Facilities and Associated Parts	Any quantity for IPZs/WHPA-Es and WHPAs
3.1 Application of Agricultural Source Material (ASM) to land	Any quantity for IPZs/WHPA-Es and WHPAs
4.1 Storage of Agricultural Source Material (ASM)	Any quantity for IPZs/WHPA-Es and WHPAs
6.1 Application of Non-Agricultural Source Material (NASM) to land	Any quantity for IPZs/WHPA-Es and WHPAs
7.1 Handling and Storage of Non-Agricultural Source Material (NASM)	Any quantity for IPZs/WHPA-Es and WHPAs
8.1 Application of Commercial Fertilizer to Land	Any quantity for IPZs/WHPA-Es and WHPAs
9.1 Handling and Storage of Commercial Fertilizer	Any quantity for IPZs/WHPA-Es and WHPAs
21.1 Agricultural Source Material (ASM) Generation - Livestock Grazing or Pasturing	Any quantity for IPZs/WHPA-Es and WHPAs
21.2 Agricultural Source Material (ASM) Generation - Outdoor Confinement Area (OCA) or Farm Animal Yard	Any quantity for IPZs/WHPA-Es and WHPAs
Parameter: Phosphorus (total)	
1.1 Disposal of Hauled Sewage to Land	Any quantity for IPZs/WHPA-Es and WHPAs
1.2 Application of Processed Organic Waste to Land	Any quantity for IPZs/WHPA-Es and WHPAs
1.8 Storage of Hauled Sewage	Any quantity for IPZs/WHPA-Es and WHPAs
1.9 Storage of Processed Organic Waste or Waste Biomass	Any quantity for IPZs/WHPA-Es and WHPAs
2.1 Industrial Effluent Discharges	Any quantity for IPZs/WHPA-Es and WHPAs
2.2 Onsite Sewage Works	Any quantity for IPZs/WHPA-Es and WHPAs
2.3 Storm Water Management Facilities and Drainage Systems: Outfall from a Storm Water Management Facility or Storm Water Drainage System	Any quantity for IPZs/WHPA-Es and WHPAs
2.4 Storm Water Management Facilities and Drainage Systems: Storm Water Infiltration Facility	Any quantity for IPZs/WHPA-Es and WHPAs
2.5.1 - 2.5.5 Wastewater Collection Facilities and Associated Parts: Force main or Rising Main	> 250 m ³ /day for IPZs/WHPA-Es Any quantity for WHPAs
2.5.6 - 2.5.10 Wastewater Collection Facilities and Associated Parts: Gravity Sanitary Sewer	> 250 m ³ /day for IPZs/WHPA-Es > 250 m ³ /day for WHPAs
2.6 Wastewater Collection Facilities and Associated Parts: Outfall of a Combined Sewer Overflow (CSO), or a Sanitary Sewer Overflow (SSO) from a Manhole or Wet Well	Any quantity for IPZs/WHPA-Es > 1000 m ³ /day for WHPAs
2.7.1 - 2.7.5 Wastewater Collection Facilities and Associated Parts: Sewage Pumping Station or Lift Station Wet Well	> 250 m ³ /day for IPZs/WHPA-Es > 250 m ³ /day for WHPAs
2.7.6 - 2.7.10 Wastewater Collection Facilities and Associated Parts: a Holding Tank or a Tunnel	> 250 m ³ /day for IPZs/WHPA-Es Any quantity for WHPAs

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

2.8.1 - 2.8.5 Wastewater Treatment Facilities and Associated Parts: final effluent outfall or a sewage treatment plant overflow outfall	Any quantity for IPZs/WHPA-Es > 500 m ³ /day on an annual basis for WHPAs
2.8.6 - 2.8.15 Wastewater Treatment Facilities and Associated Parts: sewage lagoon that does not discharge to surface water, sewage treatment plant process tank or a sewage treatment plant holding tank	Any quantity for IPZs/WHPA-Es and WHPAs
3.1 Application of Agricultural Source Material (ASM) to land	Any quantity for IPZs/WHPA-Es and WHPAs
4.1 Storage of Agricultural Source Material (ASM)	Any quantity for IPZs/WHPA-Es and WHPAs
6.1 Application of Non-Agricultural Source Material (NASM) to land	Any quantity for IPZs/WHPA-Es and WHPAs
7.1 Handling and Storage of Non-Agricultural Source Material (NASM)	Any quantity for IPZs/WHPA-Es and WHPAs
8.1 Application of Commercial Fertilizer to Land	Any quantity for IPZs/WHPA-Es and WHPAs
9.1 Handling and Storage of Commercial Fertilizer	Any quantity for IPZs/WHPA-Es and WHPAs
14.1 Storage of Snow on a Site	Any quantity for IPZs/WHPA-Es and WHPAs
21.1 Agricultural Source Material (ASM) Generation - Livestock Grazing or Pasturing	Any quantity for IPZs/WHPA-Es and WHPAs
21.2 Agricultural Source Material (ASM) Generation - Outdoor Confinement Area (OCA) or Farm Animal Yard	Any quantity for IPZs/WHPA-Es and WHPAs
Parameter: Sodium	
2.3 Storm Water Management Facilities and Drainage Systems: Outfall from a Storm Water Management Facility or Storm Water Drainage System	Any quantity for IPZs/WHPA-Es and WHPAs
2.4 Storm Water Management Facilities and Drainage Systems: Storm Water Infiltration Facility	Any quantity for IPZs/WHPA-Es and WHPAs
12.1 Application of Road Salt	Any quantity for IPZs/WHPA-Es and WHPAs
13.1 Handling and Storage of Road Salt - Exposed to Precipitation or Runoff	Any quantity for IPZs/WHPA-Es and WHPAs
13.2 Handling and Storage of Road Salt - Potentially Exposed to Precipitation or Runoff	Any quantity for IPZs/WHPA-Es and WHPAs
13.3 Handling and Storage of Road Salt – Not Exposed to Precipitation or Runoff	Any quantity for IPZs/WHPA-Es and WHPAs
14.1 Storage of Snow on a Site	Any quantity for IPZs/WHPA-Es and WHPAs
Parameter: Tetrachloroethylene (PCE)	
2.1 Industrial Effluent Discharges	Any quantity for IPZs/WHPA-Es and WHPAs
16.1 Handling and Storage of a Dense Non-Aqueous Phase Liquid (DNAPL)	Any quantity for IPZs/WHPA-Es and WHPAs
Parameter: Trichloroethylene (TCE)	
1.4 Landfilling (Hazardous Waste or Liquid Industrial Waste)	Any quantity for IPZs/WHPA-Es and WHPAs

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

1.5 Landfilling (Municipal Waste)	Any quantity for IPZs/WHPA-Es and WHPAs
1.6 Liquid Industrial Waste Injection into a well	Any quantity for IPZs/WHPA-Es and WHPAs
1.12 Storage of Subject Waste at a Waste Generation Facility: site requires generator registration under Section 3 of O. Reg. 347	Any quantity for IPZs/WHPA-Es and WHPAs
2.1 Industrial Effluent Discharges	Any quantity for IPZs/WHPA-Es and WHPAs
2.6 Wastewater Collection Facilities and Associated Parts: Outfall of a Combined Sewer Overflow (CSO), or a Sanitary Sewer Overflow (SSO) from a Manhole or Wet Well	Any quantity for IPZs/WHPA-Es > 1000 m ³ /day for WHPAs
2.8 Wastewater Treatment Facilities and Associated Parts	Any quantity for IPZs/WHPA-Es and WHPAs
16.1 Handling and Storage of a Dense Non-Aqueous Phase Liquid (DNAPL)	Any quantity for IPZs/WHPA-Es and WHPAs
Parameter: Pathogens: e.g. <i>Escherichia coli</i> (E. coli), total coliform	
1.1 Disposal of Hauled Sewage to Land	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
1.2 Application of Processed Organic Waste (POW) to land	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
1.8 Storage of Hauled Sewage	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
1.9 Storage of Processed Organic Waste (POW)	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.1 Industrial Effluent Discharges	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.2 Onsite Sewage Systems	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.3 Storm Water Management Facilities and Drainage Systems: Outfall from a Storm Water Management Facility or Storm Water Drainage System	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.4 Storm Water Management Facilities and Drainage Systems: Storm Water Infiltration Facility	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.5 Wastewater Collection Facilities and Associated Parts: Sanitary Sewers	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.6 Wastewater Collection Facilities and Associated Parts: Outfall of a Combined Sewer Overflow (CSO), a Sanitary Sewer Overflow (SSO) or Pumping Station Overflow (PSO)	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.7 Wastewater Collection Facilities and Associated Parts: Sewage Pumping Station or Lift Station Wet Well, a Holding Tank or a Tunnel	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
2.8 Wastewater Treatment Facilities and Associated Parts; final effluent outfall or a sewage treatment plant overflow outfall &	Applicable to all IPZs/WHPA-Es and WHPAs-A/B

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

sewage treatment plant process tank or a sewage treatment plant holding tank	
2.8 Wastewater Treatment Facilities and Associated Parts; sewage lagoon that does not discharge to surface water	Applicable only for WHPAs-A/B
3.1 Application of Agricultural Source Material (ASM) to land	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
4.1 Storage of Agricultural Source Material (ASM)	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
5.1 Management of Agricultural Source Material -Discharge from Aquaculture	Applicable only for IPZs/WHPA-Es
6.1 Application of Non-Agricultural Source Material (NASM) to land	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
7.1 Handling and Storage of Non-Agricultural Source Material (NASM)	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
21.1 Agricultural Source Material (ASM) Generation - Livestock Grazing or Pasturing	Applicable to all IPZs/WHPA-Es and WHPAs-A/B
21.2 Agricultural Source Material (ASM) Generation - Outdoor Confinement Area (OCA) or Farm Animal Yard	Applicable to all IPZs/WHPA-Es and WHPAs-A/B

Appendix B: Activities related to the circumstances of threat sub-category # 1.13

The following wastes are included in threat sub-category # 1.13: Storage of Waste at a Waste Generation Facility: site that is exempt or excluded from generator registration requirements.

from O. Reg. 347 Waste Management:

Hazardous wastes or liquid industrial wastes generated by waste generators that fall under Section 1 (3):

- *Paragraph 1:* Waste from the servicing of motor vehicles at a retail motor vehicle service station or service facility that has a written agreement for the collection and other management of such waste with the owner or operator of a waste management system in respect of which an environmental compliance approval has been issued authorizing the collection and other management of such waste. Note: the storage of waste oils that do not meet the description above falls under the threat sub-category 1.12.
- *Paragraph 2:* Intact waste batteries destined for a waste battery recovery facility.
- *Paragraph 3:* Common mercury waste destined for a common mercury waste recovery facility.
- *Paragraph 4:* Waste electrical and electronic equipment (WEEE) that is intact and is destined for a site at which it is to be processed for the recovery of materials.
- *Paragraph 5:* Printed circuit boards that are waste are intact and are destined for a site at which they are to be processed for the recovery of materials.
- *Paragraph 6: Waste from,*
 - a nursing home under the *Nursing Homes Act*,
 - a home under the *Homes for the Aged and Rest Homes Act*,
 - a home for special care under the *Homes for Special Care Act*,
 - the professional office of a member of the Royal College of Dental Surgeons of Ontario, or
 - the professional office of a member of the College of Physicians and Surgeons of Ontario.O. Reg. 102/07, s. 1 (7).

Hazardous wastes or liquid industrial wastes generated by waste generators that fall under certain paragraphs in Section 3 (2):

The wastes described in subsection 3 (2) were assessed for the risks they may pose to sources of drinking water for the storage of hazardous wastes or liquid industrial waste. The waste described in the following paragraphs is included in threat sub-category # 1.13.

- *Paragraph 1:* Hazardous waste or liquid industrial waste, other than used or shredded or chipped tires, if, the waste is transferred by a generator for direct transportation to a site to be wholly used at the site in an ongoing agricultural, commercial, manufacturing or industrial process or operation that, is used principally for functions other than waste management, and does not involve combustion or land application of the waste, or the waste is neither excess soil, other

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

than excess soil described in subsection 3 (8) of Ontario Regulation 406/19 (On-Site and Excess Soil Management) made under the EPA, nor processed organic waste from a composting facility, and the waste is transferred by a generator for direct transportation to a site, to be promptly packaged for retail sale to meet realistic market demand or to be offered for retail sale to meet realistic market demand.

- *Paragraph 3:* Residue remaining after the metal is recovered from wire and cable and transferred by a generator for direct transportation to a site at which it will be processed for recovery of metal and plastic using a process that does not involve combustion of the residue or any part of the residue.
- *Paragraph 6:* Pickle liquor transferred by a generator for direct transportation to a site at which it is to be wholly utilized as a treatment chemical in a sewage work that is subject to the Ontario Water Resources Act, a sewage works outside Ontario if the utilization of pickle liquor for this purpose is acceptable to the environmental regulatory authority in the jurisdiction where the sewage works are located, or a wastewater treatment facility that discharges into a sanitary sewer.
- *Paragraph 7:* Solid photographic waste that contains silver, including spent chemical recovery cartridges that contain silver, transferred by a generator and destined for a site at which it is to be processed for recovery of silver.
- *Paragraph 8:* Waste paint or waste coatings transferred by a generator and destined for a site at which the waste is to be used in an ongoing manufacturing process for the production of paint or coatings if the process does not involve combustion of the waste and the paint or coatings that are produced are not used as fuel.
- *Paragraph 10:* Spent activated carbon transferred by a generator for direct transportation to a site at which it is to be used in a process to reactivate activated carbon.
- *Paragraph 13:* Waste that is to be processed and used at the same site where it is generated, if, neither the processing nor the use of the waste involves combustion or land application of the waste, and the waste is not PCB waste, soil, or a soil mixture.
- *Paragraph 17:* Waste asphalt pavement transferred by a generator for direct transportation to a site at which it is to be used as construction aggregate, or a site at which waste asphalt pavement is processed for use as construction aggregate and at which no disposal of waste or processed waste takes place.
- *Paragraph 18:* Waste asphalt pavement transferred by a generator for direct transportation to a site at which waste asphalt pavement is stored for use as construction aggregate, if the waste asphalt pavement is stored at least 30 metres away from the nearest watercourse, lake or pond, or there are engineered works in place to prevent the waste from having any adverse effect on any watercourse, lake or pond, and the waste asphalt pavement is stored at a construction area for not more than 120 days, a permanent place of business for a person who is in the business of construction, a pit or quarry for which a permit or license has been issued under the *Aggregate*

Ministry of the Environment, Conservation and Parks
Conservation and Source Protection Branch

Resources Act, a road works yard owned by a municipality or the Crown in right of Ontario, or a place that is at least 100 meters from the nearest dwelling.

- *Paragraph 19:* Waste asphalt shingles transferred by a generator and destined for a site at which they will be used as aggregate or surface layer in the construction of walkways for pedestrian use, roads or parking areas, if, before being used for that purpose, the shingles are processed at a site at which the only processing that occurs is sorting, size reduction and the removal of other wastes from the shingles.

Bulletin: Considering Climate Change Impact on Water Quality under the *Clean Water Act, 2006*.

Date: February 15, 2022



Table of Contents

1- Purpose.....	2
2- Background	2
3- Climate Change Impact Assessment in Assessment Reports.....	3
3-1 Assessment Approach.....	3
3-2 Data Used for the Assessment.....	5
3-3 Assessment Results	6
3-4 Uncertainty Assessment	6
4- Inclusion of Climate Change Impact Assessment in Source Protection Plans	7
4-1 Education and Outreach and Other Approaches to Encourage Actions.....	7
4-2 Other Actions	8
4-3 Regulatory Tools Outside of the <i>Clean Water Act, 2006</i>	8
5- References	9

1- Purpose

The purpose of this bulletin is to help municipalities and source protection authorities (local authorities) who choose to include climate change impacts in assessment reports and source protection plans developed under the *Clean Water Act, 2006* (the Act).

2- Background

Ontario's climate is changing, with more frequent and extreme events such as severe rain, ice and windstorms, prolonged heatwaves, and milder winters. Affected sectors across our economy, local communities, Indigenous communities, and individuals recognize the need to address the impacts of a changing climate.

Climate change can affect hydrological processes such as evaporation, transpiration, condensation, precipitation, runoff, and infiltration. Long-term significant variations in these processes may impact the hydrological characteristics of drinking water sources, including the water level in surface water bodies (e.g. lake levels from storm surges), the aquifer water table variability, and the quality of drinking water sources. To advance our understanding of climate change impacts on our water resources, we need to analyze information and data on existing and future climate trends and their relationship to hydrological processes and water quality.

Hydrological processes are considered in the delineation of the vulnerable areas associated with drinking water sources as outlined in the Director's Technical Rules under the Act (Rules). These vulnerable areas are Wellhead Protection Areas (WHPAs), Intake Protection Zones (IPZs), Highly Vulnerable Aquifers (HVAs), and Significant Groundwater Recharge Areas (SGRAs). They were delineated to identify water quality and quantity risks to municipal drinking water sources as outlined in the local assessment reports, and policies to address these risks are in local source protection plans.

To complement this, Rule 15.3 allows local authorities to consider climate change information, data, and analysis as part of the local assessment report and source protection plan. This is a local decision. If the opinion of the local authority is that the data available is sufficient to undertake a climate risk assessment on the quality of drinking water sources and the results of the assessment conclude that the drinking water system is resilient and/or vulnerable to climate change impacts, then this information can be included in the future updates of local assessment report and source protection plan.

The climate change impact assessment results may inform local discussions and decision-making on how to address climate change impacts. It is important to mention that the climate change impact assessment results do not alter the delineation or the scoring of the vulnerable areas, nor do they affect the risk level of drinking water threats outlined in the local source protection plan and assessment report.

Technical Rule 15.3 reads:

If an assessment report includes a climate change risk assessment in relation to a wellhead protection area or intake protection zone delineated in the assessment report, the following shall be included in the assessment report,

- (1) *An explanation of why specified climate data sets were used as the basis for the climate change impact assessment;*
- (2) *A summary of the findings of the climate change impact assessment;*
- (3) *A description of the approach used to evaluate the vulnerability of a drinking water system to climate impacts identified in the climate change impact assessment; and*
- (4) *An explanation of the results of the evaluation under subrule (3), including whether the evaluation concluded that the drinking water system is resilient to the climate impacts identified in the climate change impact assessment.*

Note that climate change impacts on water quantity have been recognised in the Rules as part of the water quantity water budget assessment. Rule 19(13) requires the inclusion of climate data in the conceptual water budget where climate change projections and modelling are completed (<https://www.ontario.ca/page/2021-technical-rules-under-clean-water-act>).

3- Climate Change Impact Assessment in Assessment Reports

If the local authority decides to include the findings of the climate change impact assessment in the assessment report, the report is to document the assessment results as outlined in sections 3-1 to 3-4 below. In accordance with Rule 9(2), a written description of the work undertaken, which may include but is not limited to climate data analysis, methods, modelling, gaps, and uncertainty analysis, are to be documented in the assessment report.

Note: The Ministry cannot advise on the methodology/assessment approach to use for a climate change impact assessment, but it is important that the local authority ensures the methodology used is robust enough to yield findings from the drinking water source protection perspective. It is important that the authority document the rationale for choosing the methodology and any assumptions and limitations.

3-1 Assessment Approach

A full description of the approach used to evaluate climate change impacts on water quality can include the following:

a. Scale:

The selection of the study area is an important step in conducting the impact assessment as it explains why the local authority wishes to conduct the assessment and how the scale of the study area services the purpose and scope of the assessment. Depending on the information available, the study area can be at the watershed, sub-watershed(s), source protection area, or regional scale.

Although there is no specific criterion for selecting the scale of the study area, consider the following while selecting the scale:

- Type of the drinking water source, i.e. surface water or groundwater, and the drinking water systems (e.g. a lake vs. a river or a deep confined vs. a shallow unconfined aquifer).

- Geology/hydrogeology settings of the area, e.g. Niagara Escarpment or ground watershed.
- Availability of climate data/stations and/or scales of hydrological/hydrogeological modelling relevant to the study area.

The scale of the study area also informs the selection of the approach type as described below.

b. Type: quantitative, qualitative or a combination of both.

Assessment of climate change impacts on water quality can be done quantitatively, qualitatively, or a combination of both (*EPA and CDWR, 2011*). The quantitative approach uses numerical modelling and analytical tools to understand the relationships between climate indicators (e.g. temperature, precipitation) and hydrological characteristics of the drinking water sources (e.g. surface water levels, aquifer water tables). Whether physical-based / deterministic or statistical, these models may be complex and require substantial local resources and technical capacity to project future impacts on water quality using historical and current data.

The qualitative approach is sometimes preferable where resources, modelling capacity, and reliable data are limited. This approach depends on local expert/traditional knowledge and experience, historical information on specific climate events that may have impacted the quality of water, and a literature review of studies conducted for a specific drinking water system. All these can help estimate the future impact on water quality in qualitative terms such as “good”, “bad”, “low”, “high”, etc.

Given the local characteristics of the study area, a combination of both approaches may be used depending upon the data available, climate and hydrological modelling and findings, etc. When both approaches are used, the final evaluation of climate change impacts will likely be in a qualitative term that can inform discussions around climate change adaptation actions.

c. Concept: top-down or bottom-up.

There are two common concepts to understand climate change impacts on drinking water quality: top-down and bottom-up.

The top-down approach concept relies on global climate models, regional downscaling approaches, and hydrologic models to predict climate change impacts and vulnerabilities at a local water system.

The bottom-up approach concept relies on a local understanding of past and existing conditions of a topic or theme (e.g. water quality analysis) that helps to estimate the future resiliency and adaptation to climate change (*CCME, 2013*).

The selection of the approach concept depends significantly on the available local data, information, and knowledge and the available technical capacity and resources. Figure 1 demonstrates how both concepts achieve an understanding of climate vulnerability, which may be linked to the assessment of climate change impacts (*Dessai and Hulme, 2004*).

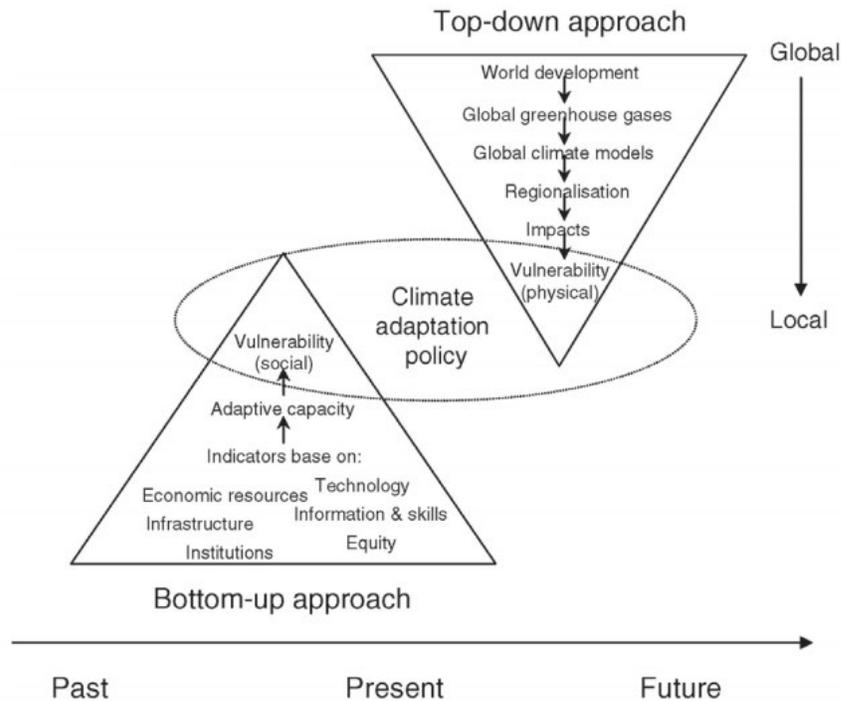


Fig.1: “Top-down” and “Bottom-up” approaches, *Dessai and Hulme, 2004*.

3-2 Data Used for the Assessment

The climate change impact assessment uses climate data, hydrological/hydrogeological data, and source protection information. Data/information sources and the analysis need to be provided in the assessment report. The Ministry of Environment, Conservation, and Parks (ministry) recommends using the best available climate data and information, especially when predicting future climate trends. Using the best available science may narrow the range of uncertainty for each emission scenario used.

Climate data and/or projections would include climatic parameters/indicators such as temperature, precipitation, number of hot days, number of days of freeze-thaw cycles, number of dry days, etc. While climate data and information may be available at many sources, consider using the Ontario-specific high-resolution regional climate data, such as the Ontario Climate Data Portal as described in Appendix C of the guide “Considering Climate Change in the Environmental Assessment Process”:

<https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process#section-8>.

In addition to the climate data, other data/information can support the climate change impact assessment. This includes (and is not limited to):

- Hydrological/hydrogeological data (e.g. runoff, permeability, infiltration rates, land slope, type of soil, size of water contributing area, the interaction of surface water and groundwater (if known)).
- Land use data (e.g. rural, urban, and build-up areas).

- Source protection data (e.g. vulnerable areas (WHPAs, IPZs, HVAs, and SGRAs)), type of surface water source (river vs. lake), type of groundwater source (deep aquifer vs. shallow aquifer/confined aquifer vs. unconfined aquifer).

3-3 Assessment Results

Discussion and analysis of the climate change vulnerability assessment results can include the impact on water quality and the resiliency of the drinking water system to climate impacts.

Depending on the approach used to conduct the climate change impact assessment, the discussion and analysis of the findings need to consider the impact on water quality at the:

- Large-scale (e.g. watershed or sub-watershed scale).
- Medium-scale (e.g. drinking water systems vulnerable area), or
- Smaller-scale (e.g. property where drinking water threats could occur).

Given the flexibility in selecting the study area scale, the assessment approach type and concept, and the availability of data to conduct the assessment, it may not be possible to assign clear criteria to determine whether the findings of the assessment show the resiliency of the drinking water system to climate impacts. However, the input data, outputs, and approach selected may help the local authority develop local criteria to determine resiliency. The local criteria should factor in the vulnerability of the drinking water system to climate change as well as the ability of the system to cope with impacts of climate change (i.e. adaptive capacity). Both vulnerability and adaptive capacity could be part of the analysis of the selected assessment approach to determine whether the drinking water system is resilient to climate change.

3-4 Uncertainty Assessment

The factors outlined in Rule 14 can be used to analyse the uncertainty and assign a level of uncertainty of either “low” or “high”. The factors in determining the level of uncertainty depend on the quality of the climate data/information, climate projection, analysis of historical climate data and assessment approaches associated with the work, etc. This analysis, along with the professional judgements or opinions associated with the analysis, can be used to support decisions on whether or not the findings should be included in the local assessment report and/or source protection plans. The outcome of the uncertainty analysis could result in one of the following decisions:

- Do not include findings or results in the local assessment report due to low confidence (high uncertainty) in the findings.
- Include the findings or results in the assessment report and indicate low confidence in the findings.
- Include the findings or results in the local assessment report and indicate high confidence (low uncertainty) in findings.

Depending on the uncertainty level/confidence level, the local authority may choose to revisit the climate change risk assessment, without taking any action at this time, when new data or information becomes available to increase the confidence level in work done and support any future actions to address climate change impacts.

4- Inclusion of Climate Change Impact Assessment in Source Protection Plans

Regulation 287/07, section 29 states that a source protection committee may include anything in the source protection plan that, in the opinion of the committee, will assist in understanding the plan. This can include the findings of climate change risk assessment taking into consideration the outcome of the uncertainty analysis (see section 3-4).

If the local authority wishes to include the findings in the source protection plan, consider if:

- Existing management measures in place at the selected scale (section 3-3) already address the impacts of climate change;
- Additional management measures would address the impacts of climate change on the water quality of the drinking water system; and
- Options are available using non-regulatory approaches or existing municipal authorities if additional measures are warranted.

It is important to understand that the climate change impact assessment findings can not change the extent of vulnerable areas, their scores, or the prescribed threats risk ranking; thus, they can not change the legal effect of a source protection plan policy. Nor should the assessment results automatically necessitate a change in a policy approach.

As per section 26 of O. Reg. 287/07, the local authority may wish to specify actions to collect data on climate change supporting climate change adaptation and resilience actions (e.g. existing frameworks, policies, programs, strategies, action plans, water monitoring, and modelling work) that other jurisdictions have done that may help inform future decision-making within the local source protection area or region.

The following sections provide some examples of various approaches the local authority can use to incorporate the climate change impact assessment outcome in their source protection plans and/or other local programs or policies to support resiliency.

4-1 Education and Outreach and Other Approaches to Encourage Actions

General education and outreach or incentive programs can be applied to a specific area or more broadly applied across a watershed, as per section 22(7) of the Act. Information gathered from the climate change impact assessment can be incorporated into these programs so that communities better understand climate impacts on their drinking water sources. This will help identify opportunities to address these impacts and educate the public on actions that may improve resiliency. For example, education and outreach programs could encourage the planting of trees, nature-based solutions, and other green technologies to help improve infiltration and manage stormwater, and green infrastructure solutions (e.g., low impact development, green roofs) to mitigate runoff and potentially reduce flooding.

The information gained from the climate change impact assessment can also be shared with appropriate agencies, including federal, provincial, and municipal governments, for consideration in making informed decisions.

Alternative approaches that don't rely on regulatory obligations, also known as 'soft' tools, such as incentives, best management practices, and stewardship, can encourage landowners or business operators to implement small changes to their operations.

Examples could include recommendations to consider weather conditions before applying pesticides and fertilizers or raising awareness of less toxic alternative products or methods.

Alternatively, the local authority can consider the inclusion of ‘specified actions’ policies into their source protection plan enabled under s.26 of O. Reg. 287/07. Specified actions policies can only be applied in vulnerable areas and not throughout an entire municipality or watershed.

4-2 Other Actions

Where the local authority is of the opinion that the soft tools noted above are not sufficient to address climate change impacts, they can share the climate change impact assessment findings and results with municipalities and other stakeholders and discuss how this information can be used to support existing local initiatives. This could include:

- encouraging the development or update of a municipal Climate Change Action Plan (akin to a Spills Action Plan) to consider local watershed management plans (e.g. shoreline management plan where various types of adaptation actions are identified), which may help improve the resiliency of the watershed;
- considering how to use local existing natural resource-based plans or initiatives to protect our forests, soils, and wetlands. These initiatives may reduce carbon concentration from the atmosphere (i.e. mitigation) and reduce the potential for extreme rates of runoff (i.e. adaptation). See Appendix B of the guide “Considering Climate Change in the Environmental Assessment Process” for more information.
- the review of local infrastructure plans and emergency response protocols and procedures to incorporate considerations into planning and prioritizing infrastructure improvements. For instance, considering the need for emergency or backup drinking water supplies.

4-3 Regulatory Tools Outside of the *Clean Water Act, 2006*

If the local authority wishes to pursue further actions to address climate change impacts, some regulatory approaches could be used outside the Act’s framework. For example, the climate change risk assessment information can support land use planning decisions under the *Planning Act, 1990* and policies in the Official Plan for development projects. This could include recommending that a municipality ensure up-to-date floodplain mapping is used in municipal planning decisions around drinking water systems that are particularly vulnerable to climate change impacts. The process to consider climate change in land use planning is similar to how impacts are considered in environmental assessment projects.

(<https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process>).

The local authority could also consider sharing climate change impact assessment results with Risk Management Officials (RMOs) for their consideration when implementing source protection plan policies that rely on Part IV of the Act. For instance, an RMO negotiating a new risk management plan may consider including resiliency measures and/or best practices as part of the plan to adapt to climate risks. The Risk Management Measures Catalogue could be a source of information when selecting these measures.

(<https://data.ontario.ca/dataset/risk-management-measures-catalogue>).

Ultimately, considering climate change impact information in the assessment report and source protection plan can help the local authority better understand the impacts of climate change on the quality of drinking water sources in their source protection area, watersheds, or specific drinking water systems. Information sharing would help decision-making authorities and landowners alike consider climate change impacts in their planning and management decisions to protect sources of drinking water.

5- References

Canadian Council of Ministries of the Environment (CCME) 2013. "Tools for Climate Change Vulnerability Assessments for Watersheds."

https://ccme.ca/en/res/pn1494_vat-secure.pdf

Dessai and Hulme 2004. "Does climate adaptation policy need probabilities?". *Climate Policy Vol. 4 – Pages 107-128.*

Environmental Protection Agency and California Department of Water Resources 2011. Climate Change Handbook for Regional Water Planning. <https://resilientca.org/projects/814adf60-17dd-4da8-ae6a-94b9759a76af/>

Technical Rules: Assessment Reports under the *Clean Water Act, 2006, 2021.*

<https://www.ontario.ca/page/2021-technical-rules-under-clean-water-act>

Contact:

Conservation and Source Protection Branch

Source.protection@ontario.ca