



DRINKING WATER SOURCE PROTECTION

ACT FOR CLEAN WATER

Drinking Water Quality Threats and Issues Training

Guidance on Regulation and Amended Director's Technical
Rules for the development of the Assessment Report



DRINKING WATER SOURCE PROTECTION

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Presentation Outline

Process Overview

- Delineation of Vulnerable Areas
- Vulnerability Scoring
- Drinking Water Quality Threats – 3 Approaches
 - § Threats Approach
 - § Issues Approach
 - § Event based Approach
- Enumerating Significant Drinking Water Threats

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

Type of Drinking Water System in your SPA			Possible Approaches		
			Threats Approach	Issues Approach	Event Based Approach
Groundwater only			√	√	-
Type A and B Intakes and type C and D intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River	IPZ-1 and IPZ-2 Delineated	Threat modeling based IPZ-3	√	√	√
		No threat modeling based IPZ-3	√	√	-
Type C and D intakes excluding intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River			√	√	-



Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 1. Delineate Vulnerable Areas



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Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 3

Overview

3. Drinking Water Threats: Water Quality

What Is a Threat?

Drinking Water Threat: an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water, and includes an activity or condition that is prescribed by the Regulations as a drinking water threat.

What Is An Activity?

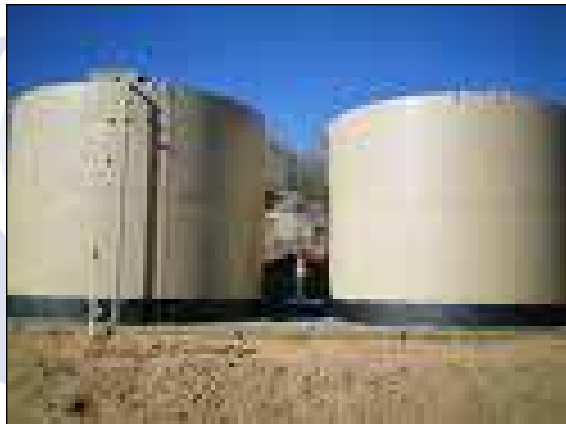
What Is a Condition?

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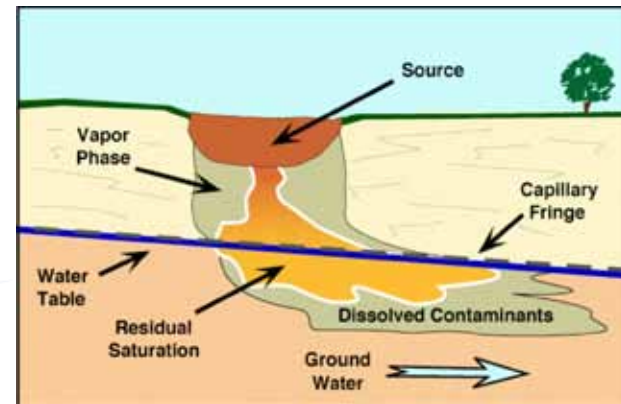
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What Is a Threat?

Examples of Activities –
storage, application, discharge



Examples of Conditions –
contaminated sediment, groundwater plume



Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 3

3A. Threats Approach

1. Listing Drinking Water Threats

For Each Vulnerable area:

- i. List the Prescribed Drinking Water Threats

List of Prescribed Drinking Water Threats

The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.

The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.

The application of agricultural source material to land.
The storage of agricultural source material.
The management of agricultural source material.

The application of pesticide to land.
The handling and storage of pesticide.

The application of commercial fertilizer to land.
The handling and storage of commercial fertilizer.

The handling and storage of non-agricultural source material.
The application of non agricultural source material to land

The handling and storage of an organic solvent

The handling and storage of a dense non-aqueous phase liquid.

The handling and storage of fuel.

The storage of snow.

The application of road salt.
The handling and storage of road salt.

The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard

The management of runoff that contains chemicals used in the de-icing of aircraft.

An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.

An activity that reduces the recharge of an aquifer.

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Step 3

3A. Threats Approach

1. Listing Drinking Water Threats

For Each Vulnerable area:

- i. List the Prescribed Drinking Water Threats
- ii. List any local threats added by the SPC with Director approval

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Step 3

3A. Threats Approach

1. Listing Drinking Water Threats

For Each Vulnerable area:

- i. List the Prescribed Drinking Water Threats
- ii. List any local threats added by the SPC with Director approval
- iii. List any conditions identified within each vulnerable area

2. Listing Circumstances

For each list produced for your vulnerable areas

- Identify the circumstances under which activities in the threat lists are:
 - § Significant,
 - § Moderate, or
 - § Low drinking water threats
- SPC can add new circumstances for threats with the approval of the director
- Refinement of lists to be specific to each vulnerable area

3. Areas Where Threats are Significant/Moderate/Low

Maps will be produced for each vulnerable area

- Illustrating the delineated zones and the respective vulnerability scores

The maps and specific vulnerability scoring will have corresponding lists of Significant, Moderate, and Low drinking water threats, as produced in the previous step (number 2: List Circumstances)

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

Type of Drinking Water System in your SPA			Possible Approaches		
			Threats Approach	Issues Approach	Event Based Approach
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Type C and D intakes excluding intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River			√	√	-



Step 4. Enumeration of Significant Drinking Water Quality Threats



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1. Issues: What is a Drinking Water Issue?

Identified at an intake, well, or monitoring well & located within one of the four vulnerable areas.

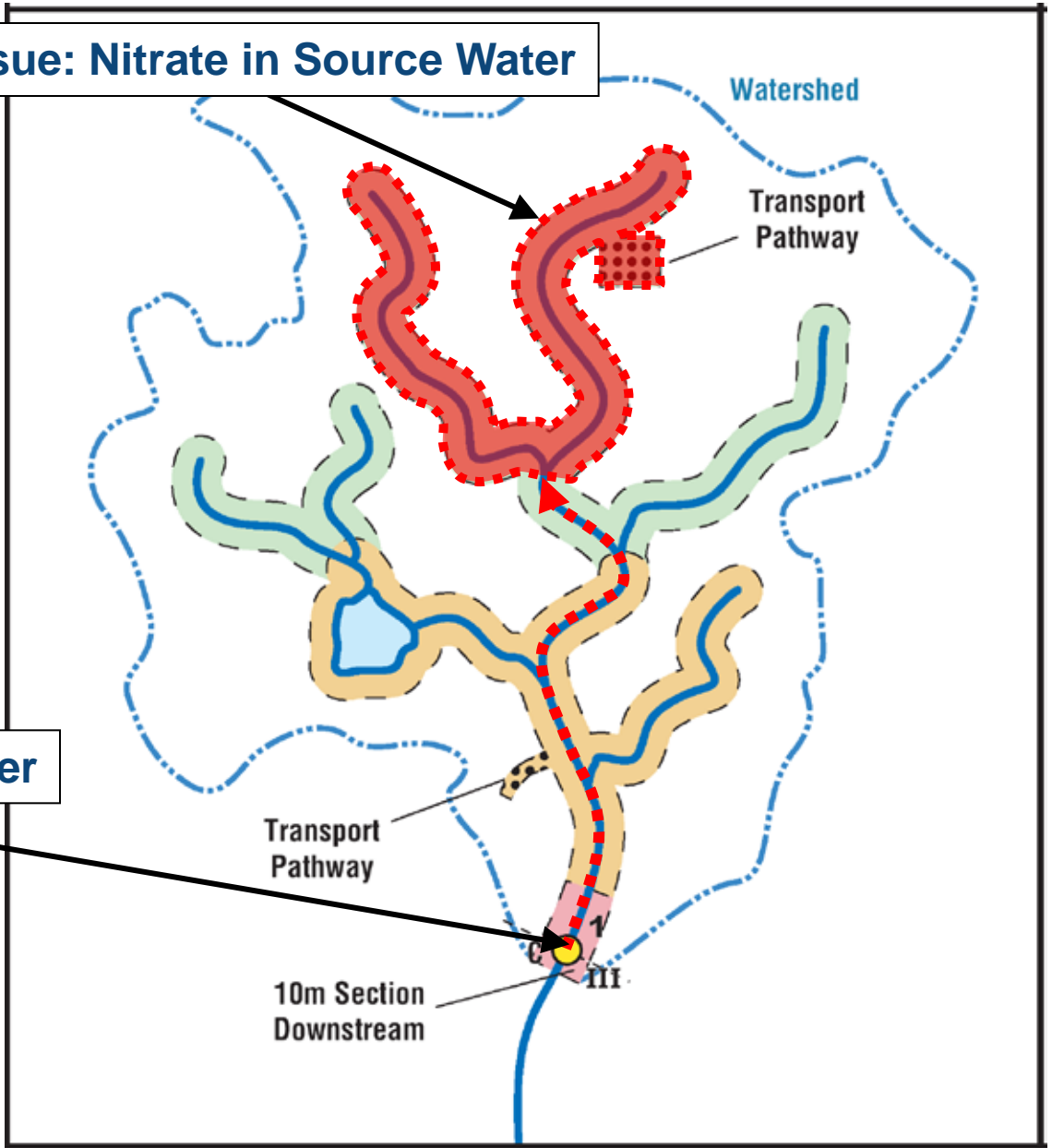
- For issues to lead to the identification of threats, the issue must meet tests set out in the rules and must result in the deterioration of the quality of water for use as drinking water.
- You have discretion here – deterioration of water is not defined. Therefore you can consider a number of different things in determining if there is deterioration.
 - § Is the source of the contaminant of concern natural or anthropogenic?
 - § Is the treatment system not sustainable for this parameter? This is an issue. Set a benchmark lower than what is in the water quality now.
 - § Does the treatment system adequately deal with this parameter under extreme events?

2. Defining and Listing Issues

- List parameter or pathogen of concern.
- List the intake, well, or monitoring well at which the issue occurred.
- For threats that meet the tests in rule 114, the SPC must show the area where threats could contribute to the issue.
 - Only the part of this "issue contributing area" that falls within one of the 4 vulnerable areas (WHPA, IPZ, HVA, SGRA) can be identified. If the contributing area extends into another SPA or outside a vulnerable area, it should be discussed, but can not be included in the evaluation of threats.
 - There is no vulnerability score associated within this "issue contributing area".
 - If you can't determine the "issue contributing area", the assessment report must include a plan for determining the extent of this area.
- List the activities and conditions that may be associated with the issue (to link the issue with what could have caused the problem or may add to the problem in the future)

Describing Drinking Water Quality Issues (Surface Water example)

Issue: Nitrate in Source Water



Issue: Nitrate in Source Water

3. Issues: Listing Circumstances

- Circumstances for Significant and Moderate threats within an Issue Contributing Area are different than listed with the threats approach.
- Therefore, you need to create tables that identify the threats associated with each issue contributing area (step 2) and under what circumstances they are a threat.
- A new list of activities/conditions and circumstances must be created for each Issue Contributing Area dependant on the issues identified.

4. Issues: Areas Where Threats Are Significant or Moderate

- This can be done with a combination of issue contributing area maps and linking them to the tables created in step 3
- For example, for municipal well x, you have an issue contributing area for nitrate. This represents the area where the circumstances for nitrates are significant drinking water threats.
- For that same list, if the issue contributing area was for a private well or system not in the terms of reference, the issue contributing area is the area where the activities related to nitrate (circumstances noted in Step 3) are moderate drinking water threats.

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Type C and D intakes excluding intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River			√	√	-



Step 4. Enumeration of Significant Drinking Water Quality Threats



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1. Event Based Approach: Delineating the IPZ

- Used in SPAs with Type A and B intakes, and Types C and D intakes in Lake Nippising, Lake Simcoe, Lake St. Clair, or the Ottawa River.
- Using this method, you delineate the outer extent of the IPZ by modelling activities or conditions to determine if contaminants could reach the intake. This outer boundary is called the IPZ-3.
- Based on local knowledge – activities are chosen to be evaluated through modeling. These activities can be located anywhere within the IPZ.
- Note, the IPZ-3 delineation is only required where this modeling has been completed.

2. Event Based Approach: Listing Threats

- If you have completed modeling or an analysis of threats, and the modeling shows that the activity or condition can create an issue at the intake, then, this existing or future activity or condition is a **significant drinking water threat**.
- The approach has been amended to include conditions and potential future activities.
- If the modeling or analysis does not show an threat can create an issue at the intake, then this activity or condition can not be listed as a **significant drinking water threat**.
- You must list any activity or condition that modelling has shown is a threat.

3. Event Based Approach: Listing Circumstances

- As with issues, the circumstances under which an activity is a significant drinking water threat change with the application of this methodology. Therefore, you must create a new list of circumstances.
- To document the circumstances, you must list:
 - § The activity or condition, including chemicals or pathogens present, and the volumes and event conditions required to cause an issue,
 - § the modeling approach or results to ensure it is clear that the circumstances that make this significant and that it is within the IPZ, and
 - § modeling has shown that release of the contaminant could cause an issue at the intake.

4. Event Based Approach: Areas where Activities are Significant Drinking Water Threats

- The identification of areas where activities are significant for this approach is different than the other methods.
- The actual “areas where the activity is significant” is the location of the activity or condition itself or the locations where a future activity would meet the modeling test.
- Our expectation is that you would identify the parcel of land on which the activity is being undertaken, the condition is located, or the areas where a future activity would be significant. Therefore, to meet the requirements of the Act, you are required to create a map showing the parcel(s), and include documentation on what activity (existing or future) or condition is significant within that parcel(s).

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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4. Enumerating Significant Drinking Water Threats

- The assessment report is required to include the number of locations where a person is engaging in an activity or condition that is or would be a significant drinking water threat.
- Based on this, it is required to inventory the number of existing significant drinking water threats including:
 - § “is” – interpret this as the locations where an activity is currently undertaken or a condition exists. (For example: fuel storage at a marina).
 - § “would be” – interpret this as locations where the infrastructure is there to undertake an activity. (For example: during the winter these tanks may be empty, but you know they will have fuel seasonally and the infrastructure is there for the fuel. Or salt storage domes with no salt).

4. Enumerating Significant Drinking Water Threats

- The level of effort to do this is dependant on your knowledge of the source protection area and vulnerable areas, along with an understanding of the level of comfort of the source protection committee, stakeholders, and public.
- Where an activity is an obvious threat (gas station, where the quantity of fuel and chemicals are relatively standard), no site visit should be required.
- Where there is little information, high uncertainty, or a high level of discomfort around an activity or condition, a site visit may be considered appropriate.
- In some areas, SPCs and CAs will have to make decisions on how many site visits can be completed based on the time and resources available.

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Step 4

Enumerating
Significant
Drinking Water Threats

4. Enumerating Significant Drinking Water Threats

Table 1 - The number of locations at which an activity that is significant drinking water threat is being engaged in (Clean Water Act (2006), Technical Rules: Assessment Report, 9 (1) (e)).

Zone Description	Prescribed Drinking Water Threat (PDWT)*	Score to Trigger a Significant Threat			
		10		8	
		Affected Parcels**	No. of PDWT	Affected Parcels**	No. of PDWT
Madoc WHPA-A	8. The application of commercial fertilizer to land	1	1	-	-
Madoc WHPA-B	10. The application of pesticide to land	2	2	-	-
Madoc WHPA-C	2. The establishment, operation or maintenance of a system that collects, stores, transmits or disposes of sewage	-	-	1	1
Madoc WHPA -C	8. The application of commercial fertilizer to land	-	-	1	1

Note: * Prescribed Drinking Water Threats, Clean Water Act (2006) – O. Reg. 287/07, 1.1(1)

** "Affected parcels" represents the number of parcels on which a specific activity is being engaged in. Some parcels may have more than one activity on-site. Additional commentary can be inserted to include the "Total Number of Affected Parcels"



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Thank You!

Questions