Lake Ontario Collaborative Group

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DSS Symposium 2023

Improving Communication & Response During Spill Events

Presentation Overview

1. **Communications Working Group – External Communications**
   - Streamlining Communications
   - The 11 Protocols

2. **Internal Implementation**
   - Running the DSS – When? How?
   - Streamlining Internal Spills Response
   - Integration with existing Spills Response

3. **Collaboration**
   - Municipalities
   - MECP
   - ECCC

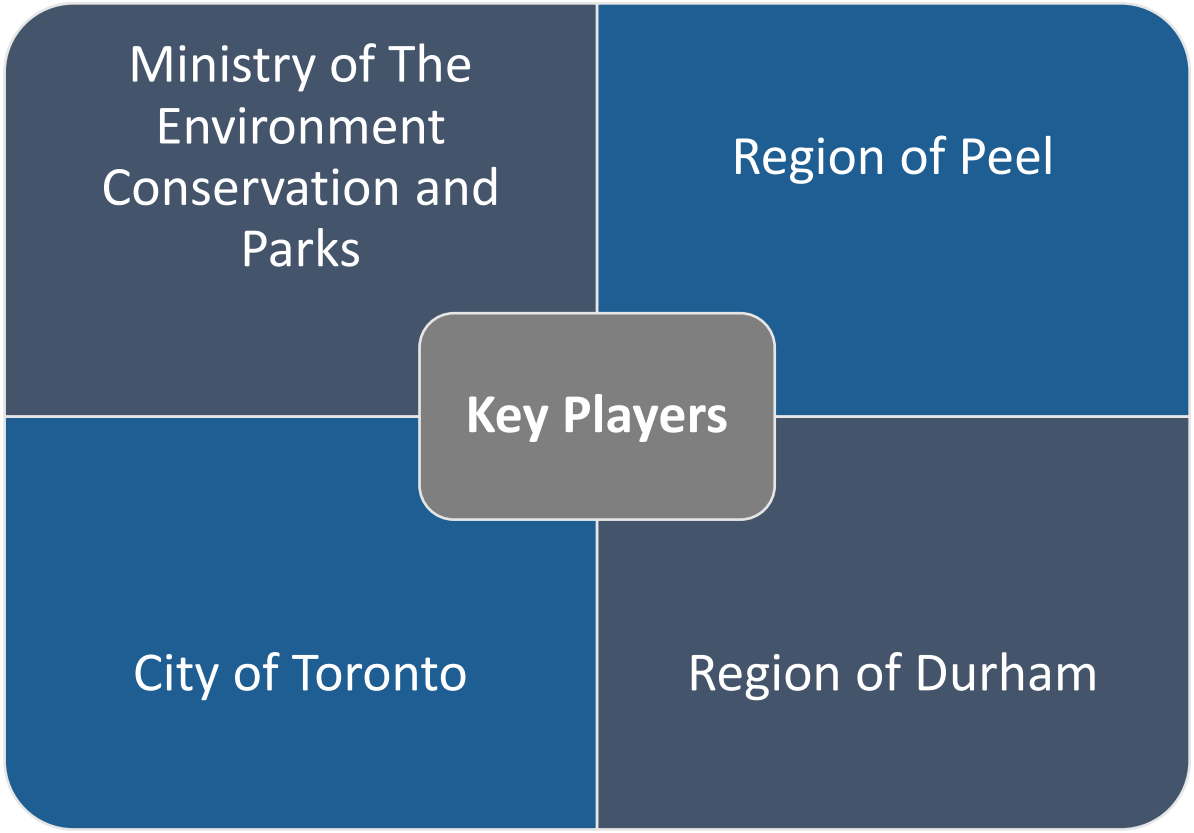
Lake Ontario Collaborative

A spill in Lake Ontario has the potential to impact numerous municipalities simultaneously

Collaboration amongst stakeholders allows for;

- Better emergency preparedness and response
- More comprehensive source water protection
- The pooling of resources and data sharing

Communications Working Group



The communications working group was developed in response to the same CTC Source Protection policies as the DSS

Communications Working Group

Goals

Standardize external communications during spill events between:

- Upper tier municipalities
- Lower tier municipalities
- The MECP
- Conservation Authorities
- Environment and Climate Change Canada

Define when communication should occur and to whom

Communications Working Group

Goals

Standardize internal emergency response during spill events within each municipality

- Align existing SOPs and emergency response plans
- Define when and how to utilize the DSS
- Create a classification system for spills to allow for uniform responses

Streamlining Response

The communications working group developed 11 spill scenario protocols

- Defines Class 1, 2 and 3 spills
- Who to contact and when
- Internal and External protocols

Divided into 11 spills types that have the potential to affect drinking water supplies

1. Discharge/Spill From Industry
2. Filter Clogging Algae Bloom
3. Harmful Algae Bloom
4. Large Fire Including Runoff
5. Nuclear Generating Station Spill
6. Sanitary Failure At WPCP
7. Sanitary Sewer Trunk Failure
8. Shipping Vessel Spill
9. Petroleum Pipeline Rupture
10. Transportation Corridor - Highway
11. Transportation Corridor - Rail

Protocol – At a Glance

G. Tritiated Water Spill

Class 2	
If the Location of the spill is: • Released to the natural environment **And if the spilled Substance is:** • Station discharge of tritium activity > 4,000Bq/L • Reactor Building Service Water (RBSW) grab samples > 30,000 Bq/L • Condenser Cooling Water (CCW) calculated tritium activity > 28, 000 Bq/L • Shoreline release with a total loading of 2.4 x 10^{13} Bq • Modelling results from the LOWQFS suggest that impacts will be observed at a DWS **Then the spill is Class 2. Complete all internal and external communication steps.** Escalation to higher Class emergency should include communication update appropriate to the situation. Not all the steps may be necessary.	
Internal Communications	External Communication
1. Initial point of contact required to notify [supervisor/designated person], who will follow municipal notification escalation protocols. a. If call is received from the MECP Spills Action Centre (SAC) then: i. provide details received from SAC to the [emergency group] or	1. Ontario Power Generation will notify Plant Operations and Police Communications Centre by fax and phone within one hour of emission confirmation. 2. Lead to contact Ontario Power Generation to determine volume of spill, concentration of radioactive material, migration, containment measures, and direction of contaminant plume.

Classification schemes (Class 1, 2 and 3 based on spill volume, type and location)

Contaminant thresholds (if applicable)

Internal Communication Steps

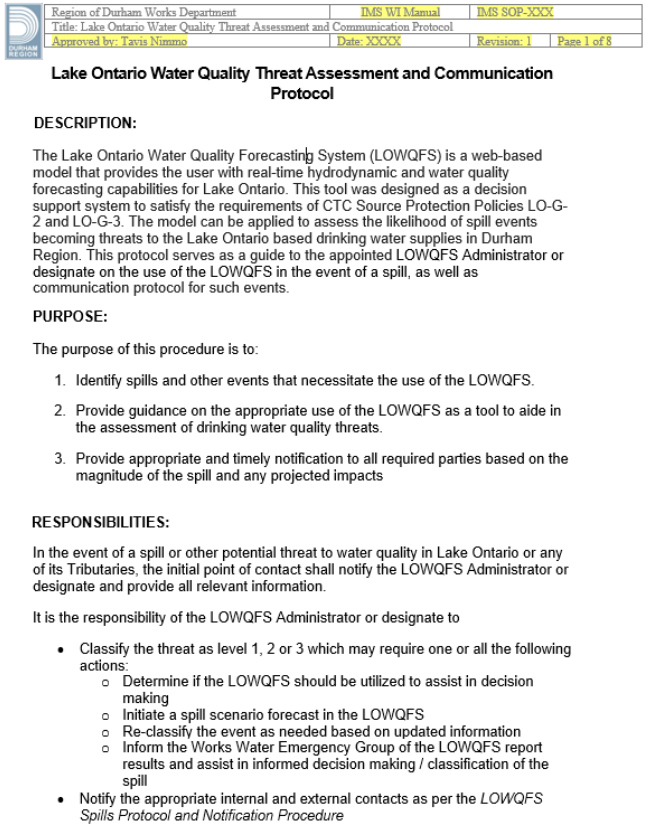
External Communication Steps

Streamlining Response

Development of SOPs and Guidance Documents

Need to Address:

- How and when to utilize the DSS model
- Pollutant assumptions when unknowns are encountered
- Who to contact; contact information
- How to classify the spill
- Actions to take based on classification



Region of Durham Works Department	IMS WI Manual	IMS SOP-XXX	
Title: Lake Ontario Water Quality Threat Assessment and Communication Protocol			
Approved by: Tavis Nimmo	Date: XXXX	Revision: 1	Page 1 of 8

Lake Ontario Water Quality Threat Assessment and Communication Protocol

DESCRIPTION:

The Lake Ontario Water Quality Forecasting System (LOWQFS) is a web-based model that provides the user with real-time hydrodynamic and water quality forecasting capabilities for Lake Ontario. This tool was designed as a decision support system to satisfy the requirements of CTC Source Protection Policies LO-G-2 and LO-G-3. The model can be applied to assess the likelihood of spill events becoming threats to the Lake Ontario based drinking water supplies in Durham Region. This protocol serves as a guide to the appointed LOWQFS Administrator or designate on the use of the LOWQFS in the event of a spill, as well as communication protocol for such events.

PURPOSE:

The purpose of this procedure is to:

1. Identify spills and other events that necessitate the use of the LOWQFS.
2. Provide guidance on the appropriate use of the LOWQFS as a tool to aide in the assessment of drinking water quality threats.
3. Provide appropriate and timely notification to all required parties based on the magnitude of the spill and any projected impacts

RESPONSIBILITIES:

In the event of a spill or other potential threat to water quality in Lake Ontario or any of its Tributaries, the initial point of contact shall notify the LOWQFS Administrator or designate and provide all relevant information.

It is the responsibility of the LOWQFS Administrator or designate to

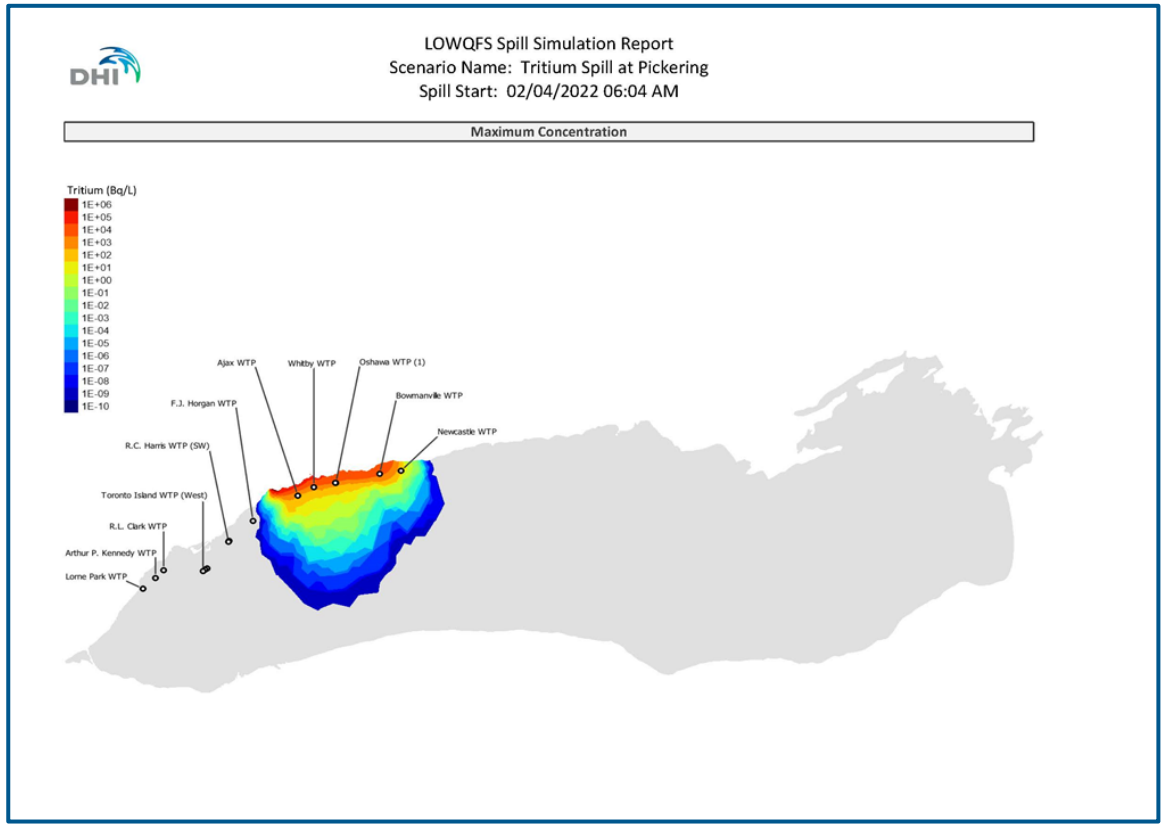
- Classify the threat as level 1, 2 or 3 which may require one or all the following actions:
  - Determine if the LOWQFS should be utilized to assist in decision making
  - Initiate a spill scenario forecast in the LOWQFS
  - Re-classify the event as needed based on updated information
  - Inform the Works Water Emergency Group of the LOWQFS report results and assist in informed decision making / classification of the spill
- Notify the appropriate internal and external contacts as per the *LOWQFS Spills Protocol and Notification Procedure*

Streamlining Internal Response

Spills will be categorized in a uniform manner

- Class 1, 2 and 3
- Based on
  - Predictions from the DSS
  - On-site information
  - The 11 protocols

This will allow for a uniform response both operationally and with respect to communications



Streamlining Internal Response

Next Steps:

- Complete work on Pollutant Reference Tables & Calculator
- Utilize these to refine Spill Classes (1, 2 and 3) and existing protocols

	A	B	C
1		**Solid Name**	**Solubility (mg/L)**
2	**Solid Name**	Rock Salt (NaCl)	358000
3	**Mass of Solid Spilled**	200	kg
4	**Volume of Polluted Water**	**558.6592179**	L
5	* Green-shaded cells are user inputs, select **Solid Name** and **Units** from dropdown lists, then enter a numerical value for **Mass of Solid Spilled.**		
6			

Calculator can be used to convert solid material spills into usable model inputs

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PDT Spills Pollutant Reference Guide

TABLE 1:

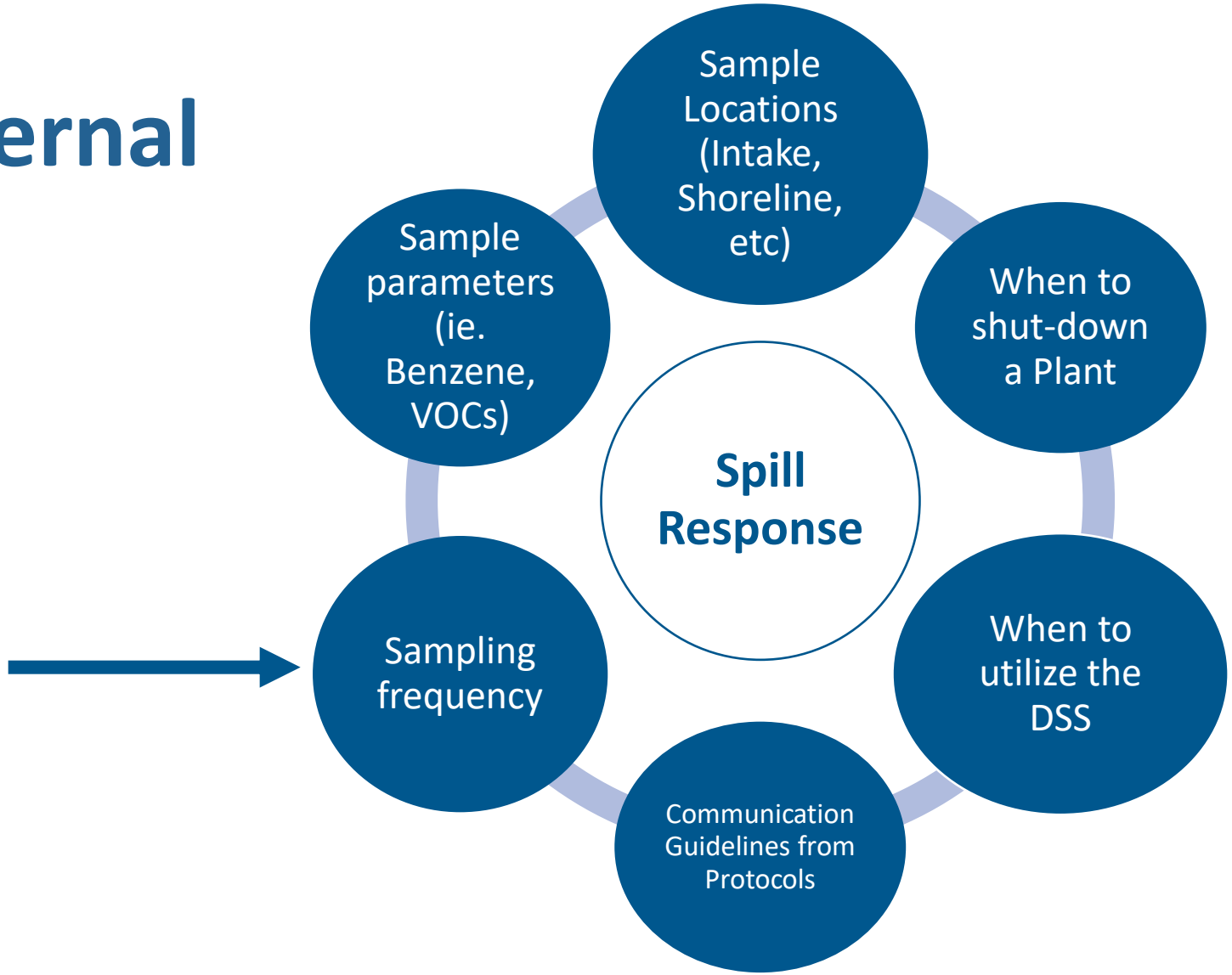
List types of pollutants, common fluid names, compounds present

Spill Type	Common Fluid Name	Compounds Present	Reference Compound Concentration in Fluid	Threshold Concentration (mg/L) Per O.Reg 169/03	Solubiltiy In Water at 25°C (mg/L)
Hydrocarbon Spill	Gasoline	Benzene	10.95 g/L	0.001	1800
		Sulphur	8.76 mg/L		
		Phosphorus	1.3 mg/L		
		Lead	5 mg/L	0.01	
		Toluene	60.59 mg/L	0.06	
		Ethylbenzene	12.41 g/L	0.14	
		Xylene	58.4 g/L	0.09	
		Ethanol	73 g/L		
	Diesel	Sulphur	12.6 mg/L		
		Aromatics (rep. Benzene)	210 g/L	0.001	1800
		Aliphatic Hydrocarbon (rep. C13 Alkane, tridecane)	630 g/L		
	Jet Fuel	Aromatic (rep. Benzene)	210 g/L	0.001	1800
		Sulphur	2.52 g/L		
	Other petroleum Products (e.g. transformer oil, hydraulic fluids, mineral oil, motor oil)	Aromatic (rep. Benzene)	450 g/L	0.001	1800
Vehicular Spill	Anti Freeze/Engine Coolant	Ethylene Glycol	1113.5 g/L		
		Propylene Glycol	1036.1 g/L		
Inorganic Spill	Road/Rock Salt	Sodium	-		

Streamlining Internal Response

Next Steps:

- Define these actions for each Spill Class/Type
- Utilize the model and past spill scenarios to inform our policies
- Integrate these actions into existing SOPs and Emergency Plans at each municipality



Collaboration

Collaboration between Peel, Durham and Toronto has allowed for the pooling of experience and resources

Financial:

- Take on larger projects
- Produce a more comprehensive product

Varied Experience:

- Allows us to create more robust protocols and procedures

Collaboration with the MECP has allowed for streamlining of existing protocols between SAC and municipalities

Collaboration

MECP, ECCC, OPG and Conservation Authorities contribute valuable lake monitoring data to the DSS project and Collaborative;

- Nearshore
- Offshore
- Tributary
- Algae monitoring

Tributary Monitoring

Collaboration

Toronto is leading the way with deployment of LCMS equipment

Durham and Peel can benefit from their experience

Lake Current Monitoring System

Thank you

Lake Ontario Water Quality Forecasting System Partners

Environment and
Climate Change Canada