

1. *What is the Threat to Drinking Water?*

A spill, as defined in Part X of the Environmental Protection Act, is a discharge a) into the natural environment, b) from or out of a structure, vehicle or other container; or c) that is abnormal in quality or quantity in light of all of the circumstances of the discharge. This paper provides background information on Spills Prevention Plans, Spills Contingency Plans and Emergency Response Plans.

The primary objectives for these plans is to help prevent or reduce the risk of spills of pollutants and prevent, eliminate or ameliorate any adverse effects that results or may result from spills. This may include notifying appropriate levels of government as well as the affected members of the public and development of plans. The impacts as well as the outcomes of most spills are directly related to the level of preparedness.

Spills prevention plans, spills contingency plans and emergency response plans are not themselves a threat to drinking water however policies can be developed without having specific local threats identified within the Assessment Report. This is under the authority of s.26(6) of O. Reg. 287/07, which indicates that a Source Protection Plan may set out policies “to update spill prevention and spill contingency plans or emergency response plans for the protection of existing drinking water sources with respect to spills that occur within a wellhead protection area or a surface water intake protection zone” along highways, railway lines and shipping lanes (Government of Ontario, 2007).

2. *What Causes this Activity to be a Drinking Water Threat?*

Spill prevention plans, spill contingency plans and emergency response plans are continually evolving documents. Major themes outlined in spill prevention plans, spill contingency plans and emergency response plans include:

- Prevention-actions taken to prevent spills or emergencies. These actions can be long-term and include capital improvements, regulations, building codes and public education;
- Mitigation-actions taken to reduce or eliminate the effects of a spill or an emergency;
- Preparedness-measures taken prior to spill or emergency to ensure effective response. Measures include plans, procedures, training and public education;
- Response-measures taken to respond to ensure a controlled, coordinated and effective response; and,
- Recovery-aim is to assist individuals, businesses and communities to return to a state of normalcy. Measures include clean up and financial assistance.

NOTE TO THE READER

*This document is one of a series of threat policy discussion papers for the Thames- Sydenham and Region in support of Source Protection Plan development. Each discussion paper looks at the nature of one or more types of drinking water threats, describes the local occurrence of those threats, assesses existing policies/programs, and introduces related ‘policy concepts’ for source protection planning. **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 the legislation.***

*This version is considered to be a **working draft** because it will be revised as the policy development process progresses. This discussion paper represents the best information available to the SPC upon which they will base their policy decisions.*

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Each one of these plans is further described in detail below, however it is important to mention that changes to any one of the included elements of these plans could lead to these plans becoming outdated. These outdated plans may be a threat to drinking water sources because they may not contain the most appropriate response to an emergency or spill. Updates to these plans could address existing gaps related to municipal drinking water supplies.

The development of policies to update these plans would act as a communication tool for both municipality and the general public. In municipalities, staff in different departments needs to be aware of vulnerable areas (i.e. wellhead protection areas (WHPA) or intake protection zones (IPZ)) in order to provide the appropriate response in the event of a spill. Through measures outlined in these different plans, the public would become aware of the location of WHPAs and IPZs.

Spill Prevention Plans

Spill prevention plans are action plans that look at the likelihood of a spill occurring and the nature and extent of adverse effects from spills. The effective implementation of spill prevention planning is a proactive component of minimizing risk posed by spills. Spill prevention plans take a risk management approach and adverse effect is analyzed through mapping of areas that may be impacted by spills. Specific places include transportation corridors; vulnerable areas defined under s.2(1) of the Clean Water Act; sensitive groundwater and surface water features; well as and/or intakes to drinking water systems and floodplain areas.

A spills prevention plan includes:

- Identification of spills-spill hazards that have the potential to cause an adverse effect are identified;
- Mapping of receptors-places that may be affected by spills are identified and mapped;
- Likelihood and consequence analysis-a statement of the likelihood of a spills occurrence and the extent of adverse effect on the mapped places is developed for each spill identified;
- Risk analysis and priority ranking-involves identifying spills that pose considerable risk;
- Risk management-involves identifying the steps to be implemented in order to manage the risk of spills occurring from those that pose a considerable risk; and,
- Training-procedures to ensure personnel are trained in the operation, monitoring and maintenance of any preventative measure to be taken (MOE, 2007).

Under O. Reg. 224/07, regular and comprehensive reviews with regards to spill prevention and mitigation are mandatory. This review involves an evaluation of the actions that have been prescribed to further reduce the risk and prevent spills.

Spill Contingency Plans

Spill contingency plans are documented procedures and actions that are to be taken during and after a spill event in order to eliminate or reduce the consequences or adverse effects of a spill (S.6 O.Reg 224/07). The purpose of this type of plan is for the potential discharger to prepare for the most efficient deployment of resources to prevent and/or contain a spill.

Spill contingency plans have two specific components, spill preparedness and spill response. Spill preparedness procedures should be in place to help prepare for all types of spills prior to their occurrence, while with spill response; procedures are to be put in place that would help with appropriate response to a spill when it occurs. Spill contingency plans also provide procedures and actions to be taken to restore the natural environment to conditions prior to a spill event.

Spill contingency plans would outline:

- Adverse effect of spills-details the procedures for the prevention, elimination or amelioration of adverse effects from spills that have been identified in the prevention plans as having adverse effect;
- Incident evaluation and the level of response-for each type of spill, procedures are detailed to evaluate the incident (i.e. material spilled, location, extent, adverse effects) and the appropriate level of response;
- Mobilization and response-details procedures for mobilizing personnel and resources to respond to spills. This step also identifies procedures to be taken to mitigate the spill including the deployment of personnel and equipment to contain the spill;
- Polluted and adverse effect monitoring;-identifies the procedures, personnel and material required to monitor the movement of pollutants and their potential adverse effects from spills;
- Roles and responsibilities-identifies the roles and responsibilities of personnel responding to a spill including the coordinator of the spill response;
- Resources and equipment-identifies the resources and equipment that are available for spill response;
- Training-identifies the training requirements for personnel involved in spill response;
- Maintenance-identifies the required maintenance for spill response equipment and materials;
- Notifications and alarms-identifies the people to be identified as well as procedures for activating alarm or notification systems as part of a spill response;
- Clean-up and restoration-identifies the procedures and actions to be taken to restore the natural environment to pre-spill conditions;
- Waste disposal-identifies the procedures for the proper disposal of wastes generated as part of a spill response; and,
- Non-reportable spills-identifies spills that are considered to be non-reportable (MOE, 2007).

After a spill has occurred and has been responded to, contingency plans are to be reviewed to determine if they were adequate in preventing and/or responding to the spill. If deficiencies are noted, these plans must be updated. The effectiveness of the implementation of contingency plans must be tested on an annual basis. Testing can be completed in different forms (i.e. table top exercises, computer simulations, live emergency drills) and must be completed over a 5 year period.

Emergency Response Plans

A response to an emergency requires a coordinated effort by different levels of government, public and private sectors; however municipalities are usually the first line of response in an emergency. An emergency response plan is required by legislation to be developed by every municipality. This plan deals with incidents that have caused or could cause damage of major proportions to life or property. An emergency response plan authorizes employees of a municipality or public servants to take action prior to the declaration of an emergency. An emergency response plan outlines:

- Specific procedures to be taken for the safety or evacuation of persons;
- Designates one or more members of council who may perform duties of head of council if head is unable to act;
- Establishes committees;
- Designates those responsible for review of the plan, training requirements and the implementation of the plan;
- Provides for obtaining and distributing materials, equipment and supplies; and,
- Provides for the implementation of the plan (Hamilton Region Source Protection Committee, 2011).

These plans are to be reviewed annually and updated as required.

3. What is the Local Scale of the Drinking Water Threat?

Although updates to spills prevention, spills contingency and emergency response plans are not themselves a threat to drinking water, it is important to discuss how they will affect the overall local picture of protecting municipal drinking water systems. The following discussion has been separated into two sections, transportation corridors, and spills prevention, spills contingency and emergency response plans.

Transportation Corridors

Southwestern Ontario has an excellent transportation network with travel and transportation connections across Canada, North America and the world. Much of the development, urban and industrial, can be traced to the availability of water, rail and road transportation, and the availability of good transportation continues to be a major factor in industrial and commercial development activities across the region (Thames-Sydenham and Region, 2008a).

Shipping Corridors

Within the Thames-Sydenham and Region Source Protection Region, water was the most important initial means of transportation especially for those communities along the St. Clair River (Thames-Sydenham and Region, 2008b). The boundaries of the Lower Thames Valley Conservation Authority (LTVCA) and St. Clair Region Conservation Authority (SCRCA) include the shorelines of Lake Erie, Lake St. Clair, Lake Huron and the St. Clair River. Deep water ports and docking facilities along the St. Clair River provide connections to the Great Lakes and worldwide ports. Ferry services at Sombra and Walpole also provide international crossings (Thames-Sydenham and Region, 2008b).

Rail Corridors

Rail transportation is essential for the economic growth and safe movement of goods (Transport Canada, 2011). Freight rail helps to alleviate the pressure on highway infrastructure (ex. A single CP train takes as many as 280 trucks off the roads) (CPR, 2011). Within Ontario there is a vast network of railway. The Thames-Sydenham and Region is location within a major railway corridor that extends from Windsor to Quebec City.

Highway Corridors

Within the Thames-Sydenham and Region major road corridors include Highway 401, Highway 402 and the Sarnia international border crossing. Highway 401 was completed in the late 1960s and has evolved from a convenient by-pass to a major economic corridor. Thousands of transport trucks use this corridor each day carrying goods to and from manufacturers and consumers (Bervers, 2011). This highway serves the counties of Essex, Chatham-Kent, Elgin, Middlesex and Oxford within the Source Protection Region. The Highway 402 corridor is a focus for industrial and commercial development in the area (Thames-Sydenham and Region, 2008b). This highway connects Highway 401 in London to the Blue Water International Bridge in Sarnia. The Blue Water International Bridge spans the St. Clair River between Point Edward/Sarnia and Port Huron, Michigan. This bridge is one of the busiest transportation arteries between the United States and Canada (Bervers, 2011).

Pipelines

The largest concentration of petroleum and chemistry industry in Ontario, “Chemical Valley” stretches along the St. Clair River in the City of Sarnia and St. Clair Township. This area represents approximately 40% of the total industry within Canada. Pipelines are a very economical way of transporting large volumes of oil or natural gas over land. Pipelines within this region link Sarnia to other parts of Canada as well as the northeastern United States (Bioindustrial Park, 2011). For example, the Enbridge East to West Line 9 pipeline stretches from Montreal to Sarnia and has a capacity of transporting 240 000 barrels of oil per day (Girard, 2010).

Spill Prevention, Spill Contingency and Emergency Response Plans

Municipalities, agencies and industries within the Thames-Sydenham and Region SPA that have spill prevention and/or spill contingency plans to address accidental spills should update them based the aim of source protection, which is to protect municipal drinking water sources. These updates could involve the inclusion of mapping and policies and procedures specific to vulnerable areas.

As outlined above, it is assumed all municipalities within the Thames-Sydenham and Region SPA have emergency response plans. As an example, the City of London Emergency Response Plan is comprised of:

- Introduction-this includes the definition of an emergency and the aim of the plan;
- Declaration/termination of an emergency-this section includes the declaration of an emergency, requests for assistance, the termination of an emergency and the recovery and restoration efforts needed;
- Notification and activation-this section involves the notification of the appropriate people as well as the activation of the appropriate levels of emergency response;
- Community control group-the community control group is responsible for providing the interchange of information, assessment and planning among the officials responsible for emergency operations. This section of the plan identifies the members as well as the roles and responsibilities of the group;
- Other agencies and organizations-this section of the plan identifies others that may be required to be activated in the event of an emergency;
- Population evaluation-this section provides information about safely evacuating the public; and,
- Plan distribution list-this section of the plan provides a list of where the emergency response plan can be found (City of London, 2010).

Emergency response plans also provide when the plan should be reviewed and how changes, if any, will be incorporated into the plan. All of the emergency response plans for the municipalities within the Thames-Sydenham and Region do not reflect the properties of source protection (i.e. vulnerable areas) within their policies and procedures.

4. *Applicable Legislation, Policies and Programs*

The following section provides a summary of the applicable legislation, policies and programs (federal, provincial or municipal) that address spills prevention, spills contingency and emergency response plans.

Table 1: Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs
Federal	Emergency Management Act
	Canadian Regional Emergency Teams
	transCAER (Transportation Community Awareness and Emergency Response) Program
	Marine

Level of Government	Applicable Legislation/Policies/Programs
	Canada-United States Joint Marine Pollution Contingency Plan
	Canadian Coast Guard Marine Spills Contingency Plan
	Transport Canada's National Marine Oil Spill Preparedness and Response Regime
	St. Lawrence Seaway Management Corporation
	Land
	Canada-United States Joint Inland Pollution Contingency Plan
	National Environmental Emergencies Contingency Plan
	Transportation of Dangerous Goods Act and Regulation
	Chemistry Industry Association of Canada <ul style="list-style-type: none"> • Responsible Care Programs • Transportation Emergency Response Program
	Canadian Railway Emergency Response Plan
Provincial	Clean Water Act 2006 <ul style="list-style-type: none"> • Ontario Regulation 287/07
	Environmental Protection Act 1990 <ul style="list-style-type: none"> • Ontario Regulation 224/07-Spill Prevention and Contingency Plans
	Nutrient Management Act
	MOE Spills Action Centre
	Emergency Management and Civil Protection Act 1990 <ul style="list-style-type: none"> • Ontario Regulation 380/04-Standards
	Province of Ontario Emergency Response Plan
	MOE Emergency Planning Program
Municipal	Municipal By-Laws and Emergency Plan
Other Jurisdictions	Raisin South Nation Source Protection Region Spill Response Project
	State of New York

a) Federal

Emergency Management Act

Emergency management in Canada is a shared responsibility relying on all levels of government. The provincial and local governments provide the first response for the majority of emergencies. Under the Environmental Management Act, the Minister of Public Safety is the Minister responsible for coordinating emergency management activities. Under this Act, Public Safety Canada develops a Federal emergency response plan that describes the general responsibilities in order to coordinate a response to emergencies. As legislation and policies change, the response plan is updated as required.

Canadian Regional Environmental Emergencies Teams

Regional Environmental Emergencies Team (REET) is a multi-agency, multi-disciplinary group designed to provide consolidated and coordinated environmental advice, information and assistance in the event of an environmental emergency. REET members represent federal, provincial and municipal government

departments, aboriginal communities, industries, and academic institutions. In Ontario, the REET is co-chaired by Environment Canada and MOE.

The function of a REET covers a variety of environmental emergency prevention, preparedness and response activities on behalf of the Responsible Party, On Scene Commander or Lead Agency, including:

- identification of environmentally sensitive resources;
- determining pollutant behaviour, fate and effects;
- identifying containment, recovery, treatment and disposal strategies;
- identification of environmental protection and rehabilitation priorities;
- assessment and monitoring of environmental impacts (damage assessment);
- production of sensitive resource, impact and response progress mapping;
- evaluation of clean-up activities;
- participation in spill response exercises;
- guidance on contingency planning; and,
- provision of training (Environment Canada, 2001)

TRANSCAER (Transportation Community Awareness and Emergency Response) Program

TRANSCAER (Transportation Community Awareness and Emergency Response) program was founded by Union Pacific Railroad and the Dow Chemical Company. This is a voluntary national outreach effort focused on assisting communities to prepare for and respond to a possible hazardous material transportation incident. The U.S and Canadian TRANSCAER programs work in conjunction with each other.

Marine-based Spills Prevention, Contingency Plans or Emergency Response Plans

Canada-United States Joint Marine Pollution Contingency Plans (Environment Canada and United States Environmental Protection Agency, 2009; Environment Canada and United States EPA, 2003)

The purpose of the Canada-United States Joint Marine Pollution Contingency Plan is to provide a coordinated system for planning, preparedness and responding to harmful substance incidents in inland and coastal waters. This plan establishes the procedures and response actions that are to be taken during the release of a harmful substance.

These plans define jurisdiction; roles and response procedures of the regulatory and support agencies; as well as communications, reporting requirements and points of contact for 5 main planning areas (Beaufort Sea; Dixon entrance; Pacific Coast; Atlantic Coast and Great Lakes). Implementation is a joint responsibility of the Canada and U.S Coast Guard and the plan is tested every 2 years.

Canadian Coast Guard Marine Spills Contingency Plan (Canadian Coast Guard, 1998)

The Canadian Coast Guard (CCG) is responsible for marine spill preparedness response in Canadian waters. Specifically, it is the lead response agency for spills from: vessels, ship to shore fuel transfer operations, mystery spills, and spills that impact or that threaten transboundary waters.

The National Chapter of the Canadian Coast Guard Marine Spills Contingency Plan defines the scope and framework within which the CCG operates to ensure appropriate response to marine pollution incidents (oil spills) as either the lead agency or supporting agency. It also sets the stage for regional and area response plans.

A Marine Chemical Emergency Response Regime is being developed by Transport Canada to outline the roles and responsibilities of government and the private sector to address hazardous material incidents (currently the CCG is equipped to respond to petroleum spills only).

The Central and Arctic Region includes Ontario and has specific responsibilities associated with the Great Lakes and St. Lawrence River. The Central and Arctic Regional Response Plan of the Canadian Coast Guard National Response Strategy (Canadian Coast Guard, 2008) suggests that contingency planning officers are continually working with industry and environmental groups, response organizations, and other governments, including that of the United States, to develop, update, test and exercise contingency plans to be ready in the event of a spill.

According to the Regional Response Plan (Canadian Coast Guard, 2008), the area plans incorporate detailed response information for specific manageable geographic areas or response communities. The plans cover the following topics:

1. Risk analysis – to determine which communities or areas are most likely to be endangered by a potential oil spill and why, their associated environmental sensitivities, plus the typical type of spill that could be expected. Environment Canada's Environmental Sensitivities Atlases are used for the initial assessment.
2. Priority Identification/Verification – through the Regional Environmental Emergencies Team (REET) at planning meetings, or through community consultation.
3. Strategy and Tactics Development – Response Management System objectives are determined by the CCG for the priorities identified through the above step. Strategies to meet the objectives (through specific activities) and details for implementation are then developed.
4. Updating – plans are reviewed and updated annually.

Under the contingency plan, the MOE Spills Action Centre is contacted by the Coast Guard when a spill occurs so that the MOE can activate its response procedures, which includes notifying downstream users such as drinking water treatment plants.

National Marine Oil Spill Preparedness and Response Regime (Transportation Canada, 2010)

Transport Canada is responsible for administering the National Marine Oil Spill Preparedness and Response Regime. This is a guideline and regulatory structure, established in 1995 as a partnership between the government and industry, that ensures the appropriate level of preparedness is available to respond to marine oil pollution incidents up to 10 000 tonnes.

As part of the national Marine Oil Spill Preparedness and Response Regime, operators of facilities that transfer oil to or from oil tankers of 150 tonnes gross tonnage, as well as the oil tankers themselves, and all other vessels of 400 tonnes gross tonnage, that travel through Canadian waters are required to have a shipboard oil pollution emergency plan, as well as an arrangement with a certified response organization that would respond to a spill on the polluter's behalf (Transport Canada, 2010). As part of the oil pollution emergency plan, ships must have on-board resources to contain a spill of oil equal to the facility's rated capability within one hour, and begin recovery/cleanup operations of oil equal to the facility's rated capability within 6 hours. Any ship that has a gross registered tonnage less than 400 tonnes and oil tankers less than 150 tonnes are not required to have a shipboard oil pollution emergency plan or an arrangement with a response organization. However, it must still report the potential or actual pollution incident to a Pollution Response Officer (Canadian Coast Guard, 2008).

Eastern Canada Response Corporation (ECRC), which is certified by Transport Canada-Marine Safety under the Canadian Shipping Act, provides marine ships and designated oil-handling facilities oil spill response preparedness. The ECRC is divided into geographic areas of response for which there are area plans similar to those of the Canadian Coast Guard. The plans include pre-established response strategies, pre-identified logistical resources, and they are updated every three years (ECRC presentation to REET, 2006). This plan, which allows for quick response, is constantly being revised based on changing response strategies and new protocols (i.e. beach clean up, alternative methods). ECRC has a response centre near Sarnia, Ontario (Corunna).

St. Lawrence Seaway Management Corporation – Seaway Handbook (St. Lawrence Seaway Management Corporation and the Saint Lawrence Seaway Development Corporation, 2010)

The St. Lawrence Seaway Management Corporation (Canada) and the Saint Lawrence Seaway Development Corporation (United States) produced a Seaway Handbook (2010) that covers a variety of topics related to the Canadian Seaway Practices and Procedures and the United States Seaway Regulations, including reporting requirements for dangerous and hazardous cargo, and accidents.

Land-based Spills Prevention, Contingency Plans or Emergency Response Plans

Canada-United States Joint Inland Pollution Contingency Plans (Environment Canada and United States Environmental Protection Agency, 2009; Environment Canada and United States EPA, 2003)

The Canada-United States Joint Inland Pollution Contingency plan establishes cooperative measures for dealing with the release of a pollutant along an inland boundary that causes or may cause damage to the environment or is a threat to public safety, health, welfare and property. Environment Canada and the United States EPA are responsible for implementing the Joint Inland Pollution Contingency Plan.

This document identifies 5 planning areas, West (Yukon, British Columbia, Alaska, Washington, Idaho, Montana); Plains (Alberta, Saskatchewan, Manitoba, Montana, North Dakota, Minnesota); Central (Ontario, Minnesota, Michigan, New York); Quebec (Quebec, New York, Vermont, New Hampshire, Maine) and East (New Brunswick and Maine). Jurisdictions, roles and response procedures of regulatory and support agencies, as well as communications, reporting systems and points of contact are outlined in this document.

National Environmental Emergencies Contingency Plan

Environment Canada has a National Environmental Emergencies Contingency Plan (1999) that covers those environmental emergencies and natural hazards which arise as sudden, unexpected events. According to the Plan, an environmental emergency is defined as a sudden or unexpected incident involving a release of a hazardous substance (or the likelihood of such a release into the natural environment) which may result in an immediate or long-term harmful effect on the environment, or constitute a danger to human life or health.

The National Environmental Emergencies Contingency Plan defines the scope and framework within which Environment Canada operates to ensure appropriate response to any environmental hazard or emergency. It describes the emergency reporting network and provides procedural guidelines for environmental emergencies staff. Each region may have its own regional contingency plan that specifies operational procedures.

Transportation of Dangerous Goods Act and Regulations (Transportation Canada, 2010)

There are two important features of interest that fall under the Transportation of Dangerous Goods Act: emergency response assistance plans (ERAP) and the Canadian Transport Emergency Centre (CANUTEC). Emergency Response Assistance Plans (ERAPs) are required for the transportation of numerous dangerous goods that are listed in the Transportation of Dangerous Goods Regulations. For example, ERAPs are required for the transportation of methylene chloride and vinyl chloride at specified concentrations. ERAPs must be registered, inspected and approved by Transport Canada. The right to ship dangerous goods can be withdrawn at any time if the ERAP is found to be inadequate. The intent of an ERAP is to provide on-site assistance to local emergency responders through the provision of emergency response advice by telephone, the provision of emergency response advice first by telephone, then by a knowledgeable person attending the accident site, and the supply of specialized equipment and a response team to mitigate the effect of the dangerous goods at the accident site. There are 162 active ERAPs in Ontario filed with Transport Canada (Transport Canada, 2010).

Federal regulations require that CANUTEC be contacted in the event of a dangerous goods accident or incident in areas under federal jurisdiction. CANUTEC is operated by Transport Canada to assist emergency

response personnel in handling dangerous goods emergencies related to all modes of transportation (Transport Canada, 2009). It has a scientific database on chemicals that are manufactured, stored and transported in Canada, and is staffed by emergency response specialists. It also has access to directories of emergency response groups and lists of specialized equipment suppliers.

The Chemistry Industry Association of Canada

Responsible Care Program

The Responsible Care program was launched in 1985 by the Chemistry Industry Association of Canada to encourage companies to continuously improve the health, safety and environmental performance of companies, and to communicate with stakeholders about chemical products and processes (Responsible Care, 2010). It involves information sharing and support networks, and a rigorous system of checklists, performance indicators and verification procedures.

Transportation Emergency Response Program

The Transportation Emergency Response Program (TEAP III), which was introduced by the Chemistry Industry Association of Canada, establishes minimum criteria for effective road and rail transportation planning, preparedness and response to incidents. This program sets the standards for planning, assessing, administering, training, resource utilization and all other aspects of transportation emergency response.

The Chemistry Industry Association of Canada has also developed an education component of this program which involves a virtual classroom, the Safety Training Tank Car CCPX 911. This tank car is used to train employees and first responder personnel on the importance of safe transport of chemical products.

Canadian National Railway Emergency Preparedness (Canadian National Railway Company, 2010)

The Canadian National Railway has developed an Emergency Response Plan and Environmental Incident Reporting and Communications Procedure to deal with environmental incidents in an immediate and coordinated manner. The plan and procedure includes information to assist CN employees in responding to a broad range of environmental emergencies and outlines the company's responsibilities for spill response, clean-up and reporting. One such procedure is contacting the MOE Spills Action Centre and local emergency responders in the event of a spill so that they can activate their response procedures.

CN has also developed a pilot project, the Responder Education Assistance and Certification (REACT) program, in British Columbia. REACT provides rural responders with quality emergency training to respond to incidents involving dangerous goods, as well as Standard Operating Guidelines to enhance dangerous goods emergency response.

b) Provincial

Clean Water Act 2006 Ontario Regulation 287/07

Section 26 of Ontario Regulation 287/07 allows for Source Protection Plans to have specific action policies that deal with updating spill prevention plans, spill contingency plans and emergency response plans for the purpose of protecting existing municipal drinking water sources. These updates should relate to spills that occur within a wellhead protection area or surface water intake protection zone along highways (as defined in subsection 1 (1) of the Highway Traffic Act), railway lines, or shipping lanes (Government of Ontario, 2007).

Environmental Protection Act (Government of Ontario, 1990)

Part X of the Environmental Protection Act outlines the required reporting and clean up of spills. Key provisions of Part X include the duty to report a spill (s.92) and the duty to clean up the pollutant and restore the spill site to pre-spill conditions (s.93). In 2005, the Environmental Enforcement Statute Law Amendment

Act (EESLAA) was passed, which amended both the EPA and the Ontario Water Resources Act (MOE, 2007). The EESLAA enabled the requirement for the regulated community to develop and implement spill prevention and contingency plans. In the development of this regulation, the nine industrial sectors that form the Municipal Industrial Strategy for Abatement (MISA) program were consulted. Under S.91.1 of the EPA, the requirements for the development and implementation of spills prevention and contingency plans are identified. Spill prevention/contingency plans are to ensure appropriate equipment, material and personnel available to respond.

Environmental Protection Act Ontario Regulation 224/07-Spill Prevention and Contingency Plans

Ontario Regulation 224/07 provides the authority for the development and implementation of plans to prevent or reduce the risk of spills or prevent, eliminate or ameliorate adverse effects from spills. The requirement for the development of these plans came into effect September 2008 and is mandatory for large industries. This regulation provides guidance on the content of these plans, which includes identifying vulnerable areas as defined in s. 2(1) of the Clean Water Act 2006. Plans are to be reviewed and updated on an annual basis. This review includes evaluating any changes that have occurred and what actions should be taken to further reduce the risk and prevent spills.

Nutrient Management Act and Ontario Regulation 267/03-General

The Nutrient Management Act passed on June 27, 2002. It addresses land-applied materials containing nutrients. The Act provides a comprehensive nutrient management framework for Ontario's agricultural industry, municipalities and other generators of materials containing nutrients, including clear environmental protection guidelines. Farms are regulated under the Nutrient Management Act if the farm generates greater than 300 nutrient units annually or generate between 5 and 300 NU annually and have applied for a building permit to construct a building used to hold farm animals or manure.

Nutrient management strategies and plans are used by some farms to optimize the relationship between the land-based application of nutrients, farm management techniques and crop requirements; to maximize the efficient use of on-site nutrients; and to minimize adverse impacts to the environment. With regards to spills contingency plans, the Nutrient Management defines them as a "proposal in Nutrient Management Strategies or Plans for dealing with...c) unanticipated releases of prescribed materials or nutrients from storage or during transport or application; d) any other contingency requiring the handling and storage of prescribed materials in an emergency" (Government of Ontario, 2003). Sections 17.1.b.1 (Nutrient Management Strategies), 24.1.b.1 (Nutrient Management Plans), 26.2 (1)(c) (NASM Plans) and S.84.4 (temporary field storage site where it is tile drained) require the completion of a contingency plan.

Ministry of Environment (MOE) Spills Action Centre

The Spills Action Centre (SAC), which is administered by the MOE, was established under the Environmental Protection Act to:

- maintain a province-wide, toll-free service for receiving, evaluating and initiating responses to notifications of spills and other urgent environmental matters that require immediate reporting to MOE on a 24-hour basis (approximately 5000 spills are reported annually);
- serve as a provincial focal point for activities dealing with spills and related emergencies;
- liaise with other agencies on spills and related emergencies;
- maintain a provincial spill database for the Ministry; and,
- provide contingency planning functions and related spill response training.

With regards to spills contingency planning, SAC prepares Operating Procedure Cards, which are guidelines routinely updated, to assist in the decision process for coordinating responses and notifying other agencies. SAC also provides interagency spill response coordination; municipal and industrial spill contingency planning advisory services; spill response advisory services and staff training.

Emergency Management and Civil Protection Act (Government of Ontario, 1990)

An emergency is defined as “a situation or impending situation caused by the forces of nature, an accident, an intentional act or otherwise that constitutes a danger of major proportions to life or property” (Government of Ontario, 1990). The Emergency Management and Civil Protection Act provides the framework for managing emergencies. This Act and its accompanying regulation set out the requirements for the development, implementation and maintenance of municipal and ministry emergency management programs. The requirements include the designation of emergency management coordination and the writing of emergency plans.

Emergency Management and Civil Protection Act Ontario Regulation 380/04-Standards

Ontario Regulation 380/04 establishes minimum standards for emergency management programs that are required for municipalities and provincial ministries for the designation of a program coordinator, committee and control group. It also specifies that an emergency centre must be established and an information officer designated to be the contact for the media and the public (Halton Source Protection Committee, 2011).

Province of Ontario Emergency Response Plan

Under the Emergency Management and Civil Protection Act, the province is required to formulate an emergency response plan. The focus of this plan is on emergency response but it also recognizes the importance of emergency management (prevention, mitigation, preparedness and recovery).

Emergency Management Ontario (EMO) is responsible to monitor, coordinate and assist with the preparation of the Provincial Emergency Response Plan (PERP). The PERP includes planning assumptions, roles and responsibilities, concepts of operations and plan maintenance.

Ministry of Environment (MOE) Emergency Planning Program

All municipalities and provincial ministries are required to have emergency management programs by the Emergency Management and Civil Protection Act. Emergency Management Ontario (EMO) provides the municipalities and provincial ministries with support to implement their programs, through tools such as guidelines and training.

The Provincial Emergency Response Plan (Emergency Management Ontario, 2008) establishes a framework for a systematic, coordinated and effective emergency response by the Government of Ontario. The plan provides a means by which the province can be made aware of a threat or emergency, can coordinate and direct provincial resources, and can declare an emergency. EMO is responsible for monitoring emergencies and response activities through the Provincial Emergency Operations Centre.

The Ministry of Environment also established an emergency response plan for spill and drinking water emergencies (Ministry of the Environment, 2007). This document provides a framework for responses to these emergencies.

c) Municipal

Municipal By-Laws and Emergency Plans

Municipalities have the ability to pass by-laws about the economic, social and environmental well-being of the municipality, and about the health, safety and well-being of people, under the Municipal Act. The Emergency Management and Civil Protection Act is the legislation that enables municipalities to develop their own

emergency plan. Under S.3 of the Act municipalities are required to adopt the emergency plan by enacting a by-law. The emergency plan of a lower municipality (in an upper tier municipality, excluding a county), is to conform to the upper tier emergency plan (s.5). Municipalities are also required to review and revise their emergency plan every year.

d) Other Jurisdictions

Raisin South Nation Source Protection Region Spill Response Project

South Nation Conservation and Raisin Region Conservation Authority secured funding under the Clean Water Act-Drinking Water Source Protection Program to enhance spill response, particularly near vulnerable drinking water sources, across the Raisin-South Nation Source Protection Region (Raisin South Nation Source Protection Region, 2008). Components of this project involved completing a needs analysis for spill response, developing a tiered spill response incident and notification procedure process.

State of New York

The State of New York has recognized that emergencies can occur without warning and in any community. Emergency planning, a process aiding in the anticipation of problems and possible solutions, is the responsibility of a government to act effectively before, during and after an emergency occurs. Two goals of the planning process are to reduce the risk of the hazard and to assess the capability to respond to the hazard. An effective emergency plan is one that is written and not forgotten (New York State, 2008).

New York State has established a policy that encourages comprehensive emergency preparedness plans to be developed. New York State law requires prevention, mitigation, response and recovery be addressed in every local government emergency response plan (New York State, 2008). Since all plans can become outdated because of social, economic, environmental conditions, the State of New York encourages its jurisdictions to establish a regular review period.

5. *Gaps in Existing Legislation, Policies and Programs*

The following table provides the gaps that exist in the legislation, policies and programs that are currently associated with spill prevention plans, spill contingency plans and emergency response plans.

Table 2: Gaps in Existing Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs	Gaps
Federal	transCAER (Transportation Community Awareness and Emergency Response) Program	<ul style="list-style-type: none"> Program is voluntary
	Land Chemistry Industry Association of Canada <ul style="list-style-type: none"> Responsible Care Programs Transportation Emergency Response Program 	<ul style="list-style-type: none"> These programs are voluntary
Provincial	Environmental Protection Act 1990 <ul style="list-style-type: none"> Ontario Regulation 224/07-Spill Prevention and Contingency Plans 	<ul style="list-style-type: none"> Legislation is high level and reactionary Focus of O. Reg. 224/07 is on large industries
	Nutrient Management Act	<ul style="list-style-type: none"> There are many farms in vulnerable areas that are not required to have NMS (this primarily

Level of Government	Applicable Legislation/Policies/Programs	Gaps
		<p>pertains to existing farm operations that generate between 5 and 300 NU annually. Unless they submit a building permit application for expansion of a livestock or manure storage facility, they would not be phased in).</p> <ul style="list-style-type: none"> • Municipalities do not receive feedback on compliance with the NMA requirements.
General		<ul style="list-style-type: none"> • Existing federal and provincial legislation, policies and programs are extensive however additional protection could be provided to municipal sources of drinking water by providing key agencies with detailed information about WHPAs and IPZs

6. Policy Considerations

- A consideration for eliminating or reducing the occurrences of spills of pollutants entering surface water and/or groundwater is to make sure spill prevention plans, spill contingency plans and emergency response plans are in place and that they are up to date;
 - Updates could address potential gaps related to municipal water supplies;
 - Policies to update plans could act as communication tools for both municipal staff and the general public;
- Prescribed instruments cannot be used as a means to address updates to spills prevention, spills contingency and emergency response plans;
- Policies will be “Strategic” in their legal effect; and,
- Policies can only use S.26 p.1 tool of Specify Action.

7. Proposed policy ideas

For discussion purposes, this section of the report provides examples of policy ideas that could be applicable to the updating spill prevention plans, spill contingency plans and emergency response plans in the Thames-Sydenham and Region. It is not an exhaustive list.

Policy Tool	Policy ideas
S.26 p.1 Specify Action	<ul style="list-style-type: none"> • Municipalities within SPA incorporate information regarding the location of vulnerable areas into Emergency Response Plans • MOE Spills Action Centre should be provided with mapping of the vulnerable

Policy Tool	Policy ideas
	<p>areas in SPA</p> <ul style="list-style-type: none"> • MOE Spills Action Centre to review and update procedure cards with municipal contacts based on WHPA and IPZ delineations • Municipalities increase signage noting the location of vulnerable areas for emergency responders (reminder for any special procedures that are identified in emergency response program) • Municipalities update spill prevention and spill contingency plans to identify WHPAs and IPZs • Municipalities implement an education and outreach program to encourage all businesses to prepare spill prevention plans, to review them and update them when required • Municipalities and industries to complete a review of own plans (spill prevention, spill contingency and emergency response plans) to ensure protection of municipal drinking water has been addressed. Portions of plans can be amended.

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Appendix A-Significant Drinking Water Threat Tables

Appendix A-significant drinking water threat tables is not applicable for the updating of Spills Prevention, Spills Contingency and Emergency Response Plans.

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Appendix B-Policy Examples

Appendix B will be added when the SPC gets to the appropriate stage in the policy discussions. The draft policies presented in appendix B are placeholder policies based on the policy ideas noted above. They are presented in this document to facilitate policy discussion at the upcoming SPC meeting. And subsequent review and comment by the Municipal Source Protection Policy Advisory committee.

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Policy Number	SP-1
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B,C,D and E • IPZ-1, IPZ-2, IPZ-3 • SGRA • HVA
Risk	N/A
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	<p>Municipalities shall update/amend their spill prevention and contingency plans to include mapping of vulnerable areas as well as special procedures related to these areas.</p> <p>Municipalities within the SPA shall incorporate the location of vulnerable areas and special procedures related to these areas into their Emergency Response Plans.</p> <p>Municipalities shall be encouraged to implement education and outreach programs to encourage businesses in vulnerable areas to prepare, review and update, when required, spill prevention plans and spill contingency plans.</p>
Implementation schedule	For existing plans, the implementation of this policy shall be within 1 year of the approval of the SPP. For future plans, this policy shall be implemented immediately following the approval of the SPP.
Monitoring Policy	<p>Municipalities shall submit an annual report to the CA indicating:</p> <ul style="list-style-type: none"> • When they reviewed their spill prevention plans, spill contingency plans and emergency response plans; • What changes, if any, they made to these plans in order to consider them up to date. These changes may involve the inclusion of mapping of vulnerable areas into their plans as well as providing special procedures related to vulnerable areas; • The number of educational and outreach packages offered to encourage businesses in vulnerable areas to prepare, review, and update spills prevention plans and spill contingency plans; • The measures of tracking the uptake of the targeted audience of the education and outreach packages.

Appendix B – policy examples

Policy Number	SP-2
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B,C,D and E • IPZ-1, IPZ-2, IPZ-3 • SGRA • HVA
Risk	N/A
Body Responsible for Implementing	MOE
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	The province shall be encouraged to implement general awareness programs, such as increasing signage within the SPA noting the location of vulnerable areas.
Implementation schedule	Within 2 years of the approval of the Source Protection Plan.
Monitoring Policy	MOE shall submit an annual report to the CA a description of the actions/measures that they have undertaken to implement Source Protection awareness programs.

Appendix B – policy examples

Policy Number	SP-3
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B,C,D and E • IPZ-1, IPZ-2, IPZ-3 • SGRA • HVA
Risk	N/A
Body Responsible for Implementing	MOE
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	<p>The MOE shall be encouraged to update the Spills Action Centre database with mapping of vulnerable areas within the SPA which have been provided by the SPC to ensure immediate and proper spills response.</p> <p>The MOE shall be encouraged to review and update the Spills Action Centre Operations Procedures Cards with municipal contacts and vulnerable area information.</p>
Implementation schedule	Immediately after the Source Protection Plan comes into effect.
Monitoring Policy	The MOE shall submit a report to the CA detailing what efforts they have undertaken at the Spills Action Centre to ensure that the protection of municipal drinking water, especially in vulnerable areas, has been addressed.

Policy Number	SP-4
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B,C,D and E • IPZ-1, IPZ-2, IPZ-3 • SGRA • HVA
Risk	N/A
Body Responsible for Implementing	Other-Industry (MISA, non-MISA, commercial businesses)
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	<p>Industries that are regulated under O. Reg. 224/07 within vulnerable areas shall be encouraged to continue to review and update/amend, as required, their spills prevention plans and spills contingency plans to ensure protection of municipal drinking water has been addressed, which would include the integration of vulnerable area locations.</p> <p>Industries that are not regulated under O. Reg. 224/07 within vulnerable areas shall be encouraged to prepare, review and update/amend, as required, spills prevention and spills contingency plans to ensure protection of municipal drinking water has been addressed, which would include the integration of vulnerable area locations.</p>
Implementation schedule	For existing plans, the implementation of this policy shall be within 1 year of the approval of the SPP. For future plans, this policy shall be implemented immediately following the approval of the SPP.
Monitoring Policy	<p>All industries within vulnerable areas shall submit an annual report to the CA indicating:</p> <ul style="list-style-type: none"> • When they reviewed their spill prevention and spill contingency plans; • What changes, if any, they made to these plans in order to consider them up to date. These changes may involve the inclusion of mapping of vulnerable areas into their plans as well as providing special procedures related to vulnerable areas • If they did not previously have a spill prevention or spill contingency plan, when these plans were developed.

Appendix C-Definitions

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 regulation as a drinking water threat (Clean Water Act, 2006₁).

Floplain: For a river, stream or small inland lake system, the area, usually lowlands adjoining a watercourse which has been or may be subject to flooding hazards (Provincial Policy Statement, 2005).

Groundwater: Water related features in the earth's subsurface including recharge (discharge areas, water tables, aquifers and unsaturated zones) that can be defined by surface and subsurface hydrogeologic investigations (Provincial Policy Statement, 2005).

Intake Protection Zone (IPZ): Refers to a surface water intake protection zone, which is an area related to a surface water intake and within which it is desirable to regulate or monitor drinking water threats (General Regulation 287/07₂). Intake Protection Zones are further delineated as:

- Intake Protection Zone 1 (IPZ-1), which is the immediate zone of 1 kilometer radius for a Great Lakes intake, drawn around the intake, until it touches the shore where it extends to a certain setback into the land;
- Intake Protection Zone 2 (IPZ-2), is delineated based on a 2 hour travel time to the intake under tributaries and creeks that drain into the lake within a 2 hour time of travel to the intake.

MISA: Municipal Industrial Strategy for Abatement

Moderate and Low Drinking Water Threats: Generally refer to prescribed activities deemed moderate or low drinking water threats based on the risk score.

Nutrients: materials that can be applied to land for the purpose of improving the growth of agricultural crops and for soil conditioning.

Nutrient Management Plan (NMP): A plan that outlines how nutrients are to be applied to given land base. These NMP are required for:

- Farms generating more than 300 Nutrient Units annually
- Farms located within 100 m of a municipal well

Nutrient Management Strategy (NMS): NMS sets out an environmentally acceptable method of managing all prescribed materials generated at an agricultural operation. A NMS is required for:

- Farms generating more than 300 NU
- Farms generating >5 Nu if:
 - An earthen lagoon is constructed
 - Building permit application to construct or expand barns used for housing livestock or other structures for storage of manure
- If there is a regulated mixed anaerobic digester on farm

Nutrient Unit (NU): A nutrient unit is equal to the amount of manure needed to give the fertilizer replacement value of the lower of 43 kg of N or 55 kg of P.

Significant Threat: A significant drinking water threat means a drinking water threat that according to a risk assessment, poses or has the potential to pose a significant risk (Clean Water Act, 2006₁)

Surface Water: Features on the earth's surface including headwaters, rivers, stream channels, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands and associated riparian lands that can be defined by soil moisture, soil type, vegetation or topographic characteristics.

Threat: Refers to an activity (land use) that poses a threat to drinking water quality or quantity.

Appendix C – Definitions

Vulnerable Area: Significant groundwater recharge area, a highly vulnerable aquifer, a surface water intake protection zone or a wellhead protection area.

Vulnerability Score: A score assigned to a vulnerable area with a higher score indicating a higher vulnerability.

Wellhead Protection Area (WHPA): Refers to an area that is related to a wellhead and within which it is desirable to regulate or monitor drinking water threats (General Regulation 297/07₂). Wellhead Protection Zones can be further delineated into:

- WHPA-A: 100 m fixed radius around each well;
- WHPA-B: 2 year time of travel to the well, excluding the area of WHPA-A
- WHPA-C: 2 to 5 year time of travel to the well;
- WHPA-D: 5 to 25 year time of travel to the well;
- WHPA-E: delineated if it is shown that a surface water system influence effectively bypass the aquifer's protection; and,
- WHPA-F: delineated if the well is subject to issues, which originate from outside the other parts of the Wellhead Protection Area.

¹Clean Water Act, 2006 (http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_06c22_e.htm)

²Clean Water Act Ontario Regulation 287/07-General (http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_070287_e.htm)