1. What is the Threat to Drinking Water?

This drinking water threat includes systems that store and/or treat human waste on - site, but does not include sewage treatment plants. These systems come in a variety of forms including earth pit privies, privy vaults, greywater systems, cesspools, leaching bed systems and associated treatment units, and holding tanks. Leaching bed systems with septic tanks or holding tanks are the systems most commonly used in the Thames-Sydenham Source Protection Area.

There are two categories of systems: small and large.

Small systems (those with a design flow less than or equal to 10,000 L/day) are subject to approval by the municipality under the *Ontario Building Code Act*. The requirements are described in more detail below. Small systems most frequently service rural residences.

Large systems (those with a design flow greater than 10,000 L/day) are subject to approval by the Ministry of the Environment (MOE) under the *Ontario Water Resources Act*. The requirements are described in more detail below. Schools, campgrounds, and larger businesses are examples of facilities that may require a large system.

2. What causes this activity to be a drinking water threat?

The MOE Tables of Drinking Water Threats (2008, as amended in 2009) identify a number of chemicals and pathogens that could make their way from on - site sewage storage and treatment systems into the groundwater and/or surface water under certain conditions. (circumstances 831 to 854 and 1955, 1956). The following chemicals and pathogens could threaten the safety of these sources of drinking water in certain situations.

- Pathogens
- Acetone
- Chloride
- dichlorobenzene-1,4 (para)
- Nitrogen
- Total phosphorus
- Sodium

The chemicals listed above are a concern for both surface and groundwater, with the exception of total phosphorous which is only considered a threat to surface water because excessive inputs of total phosphorous in surface water results in eutrophication and can cause toxic algae blooms.

Acetone - Acetone is the active ingredient in common household products like nail polish remover, paint thinner and household cleaner. It is also used in industrial products and applications such as pesticides, cleaning (e.g. printing), solvents (e.g. rubber manufacturing), and dilution and extraction (e.g. laboratories).

Chloride, Sodium and Total Phosphorus - Water softeners (water used and backwash), laundry detergents, bar soaps, foods and cleaning products may contain chloride, sodium and phosphorus.

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 threat, 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.*

Contents

Dichlorobenzene□1,4 (para) - 1,4 Dichlorobenzene (para) is used as a disinfectant, pesticide (e.g. mothballs, general agricultural insecticide), a deodorant (e.g. urinal cakes), for resin manufacturing and in the pharmaceutical industry.

Nitrogen and Pathogens - the primary source of nitrogen and pathogens in on - site systems and holding tanks is from human waste. Bacteria, viruses and protozoans are the main categories of pathogens.

The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage, for sub-threats *sewage systems or sewage works –septic systems and septic system holding tanks* are considered a significant threat for the above mentioned chemicals for a large system subject to the OWRA in a WHPA with a vulnerability score of 10, and for holding tanks subject to the Ontario Building Code. The large OWRA systems, holding tanks and small septic system subject to the *Ontario Building Code* are significant for pathogen contamination in areas with a vulnerability score of 10.

3. What is the local scale of the drinking water threat?

On - site sewage systems, particularly leaching bed systems, are prevalent throughout the Thames-Sydenham Source Protection Area in areas that are not serviced by municipal or communal wastewater treatment systems. They can be found now and in the future in all or part of the intake protection zones (IPZ), wellhead protection areas (WHPA), highly vulnerable aquifers (HVA), and significant groundwater recharge areas (SGRA). Table 1 attached to this discussion paper indicates in which parts of the vulnerable areas septic systems can be significant moderate or low drinking water threats. Table 2 summarizes the areas where significant drinking water threats have been enumerated which may be the result of septic systems. As discussed in the Assessment Reports for the region, this enumeration is based on best available information which is included to characterize the distribution of this type of drinking water threat, but is not expected to be completely accurate. Irrespective of whether threats have been enumerated, the Source Protection Plan will need to have policies which deal with both existing and future drinking water threats of this type.

Depending on the location and size of the systems, and the type of contaminant, discharge from a septic system or a spill from a holding tank can be classified as a significant, moderate or low drinking water threat. This is described in more detail in the previous section.

It should be noted that in sensitive areas holding tanks are sometimes used to protect the area since a properly functioning holding tank does not leach, thereby eliminating sewage from impacting the area. Depending on the location and size of the systems, and the type of contaminant, discharge from a septic system or a spill from a holding tank can be classified as a significant, moderate or low drinking water threat. Section 8.8.1.2 of the OBC lists acceptable criteria for a class 5 sewage system.

Table 2 displaying where septic threat activities are or would be drinking water threats in the Thames-Sydenham SPR according to the MOE Tables of Drinking Water Threats (2008, as amended in 2009) are located in Appendix A.

4. How is the Risk Currently Managed?

Ontario Building Code

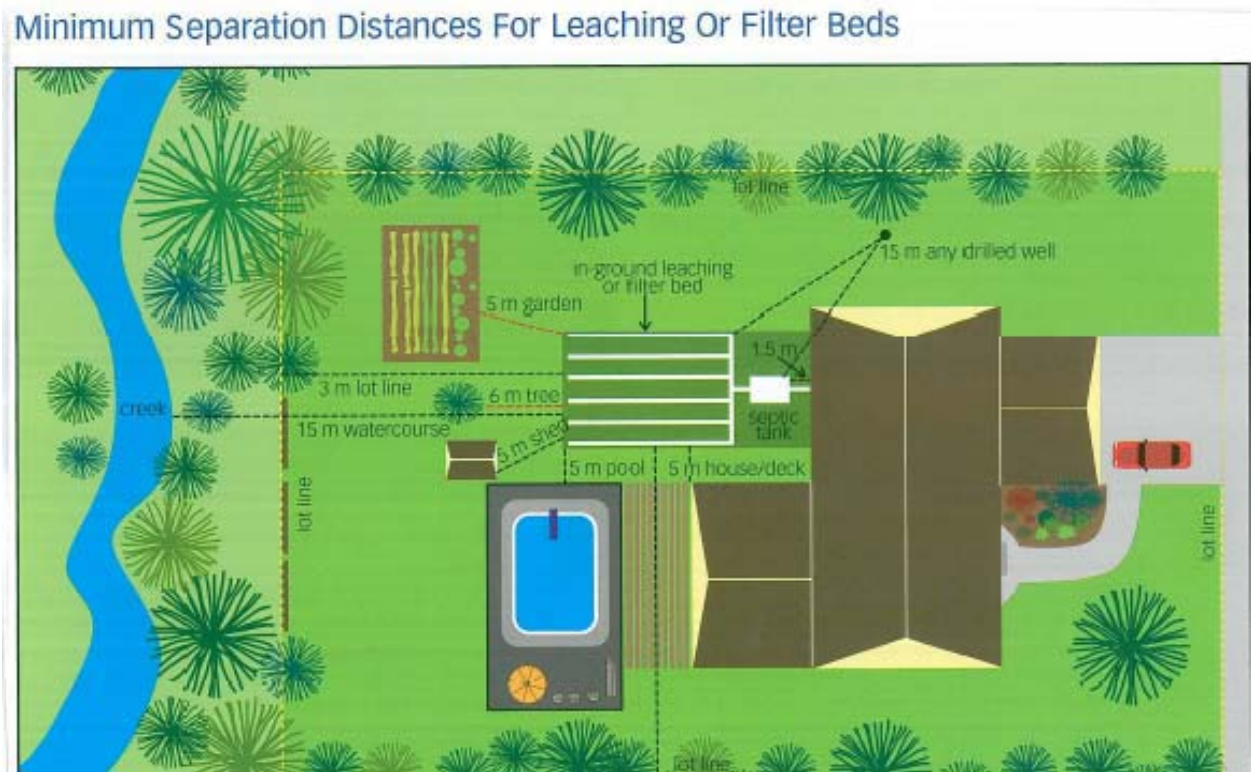
Small systems (those with a design flow less than or equal to 10,000 L/day) are subject to approval by the municipality under the *Ontario Building Code Act*. Small systems most frequently service rural residences.

There are five classes of sewage systems under the *Ontario Building Code*:

- Class 1 - Outhouse: chemical or composting toilet, incinerating toilet or vault privy.
- Class 2 - Leaching pit for grey water disposal only
- Class 3 - Cesspool for disposal of outhouse waste
- **Class 4 – Septic tank and leaching bed includes a filter bed, conventional leaching bed and chamber systems, tertiary systems (new technologies)**
- Class 5 – Holding tanks (minimum 9,000 liters)

Class 4 systems are the most common in the Thames-Sydenham Area and include the following components: a septic tank with filter (required as of January 1, 2007), a leaching bed or filter bed, and a mantle. These

systems are generally installed on a **property by property basis** conforming to minimum separation distances in the *Ontario Building Code* as displayed on the following figure.



Notes: If a leaching or filter bed is raised the separation distances are increased by twice the difference between the finished and existing grade. For instance, if the finished grade is 1.5 m higher than the existing, then 1.5 m is multiplied by 2 to equal 3 m. Three metres is then added to all the distances noted above. Municipalities can impose greater setbacks from waterbodies through their official plans and zoning by-laws.

Procedure D-5-4: Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessments

The MOE "Procedure D - 5 - 4: Technical Guideline for Individual On - Site Sewage Systems: Water Quality Impact Risk Assessments" provides technical guidance for hydrogeologists to locate septic systems in rural subdivisions with five or more units. It includes a groundwater impact assessment to address the ability of the development lands to treat septic effluent to acceptable limits. Such an assessment should be considered in conjunction with the Technical Guideline for Private Wells: Water Supply Assessment. Approval under the Ontario Building Code is required for each system that would be installed in the subdivision.

Review of Advanced Treatment Units or New Technologies

Advanced treatment units (ATU) (also referred to as tertiary treatment systems) are generally implemented in situations where the size of the lot or site conditions do not permit the installation of a conventional septic tank and associated leaching bed or when enhanced effluent quality is sought. The main difference between these systems and conventional ones are that more treatment occurs in the tank as a result of introduction of aeration and/or filter media. Common brands include EcoFlow and Waterloo Biofilter. ATUs must be approved through the Building Materials Evaluation Committee which is under the Ministry of Municipal Affairs and Housing before they can be permitted under the Ontario Building Code. Effluent targets for these systems to be classed are tertiary units BOD5 15 mg/L, CBOD5 are 10 mg/L, and the target for suspended solids is 10 mg/L. (Code and Guide for Sewage Systems – 1997 Ontario Building Code). BOD5 is Biochemical Oxygen Demand (5-day), and CBOD is carbonaceous BOD (5 day). BOD is a measure of the organic material in water or wastewater.

Ontario Water Resources Act

The review and approval of applications for **large systems** (those with a design flow greater than 10,000 L/day) rests with the MOE under the *Ontario Water Resources Act* (OWRA). Also, small systems that cross property boundaries are required to get an approval under the OWRA.

The MOE "Guide for Applying for Approval of Municipal and Private Water and Sewage Works" (August 2000) is used for a number of sewage - related facilities including large on - site sewage systems that require approval under the OWRA. The most important environmental aspect to consider as part of the approval process is the impact of the sewage works on the receiving waterbody or aquifer (groundwater). The following information is generally needed in support of an application for a large on - site sewage system

- Expected rate of contaminants discharge to the groundwater.
- Background levels of contaminants in the groundwater.
- Estimated allowable amount of degradation based on the current and potential future uses of the groundwater in accordance with "Guideline B - 7: Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities".
- Proposed measures to be taken to reduce or prevent groundwater contamination.
- Proposed monitoring program to assess the effectiveness of the proposed groundwater aquifer contamination control measures.

Guideline B - 7 states that there are four situations where a sewage disposal system would be unsuitable:

- Where no appreciable attenuation can be provided (e.g. very short time of travel to surface water),
- Natural attenuation capacity is weak (e.g. fractured rocks),
- The subsurface is suited for better use (e.g. an esker that could be used as a water supply), and
- The consequences of failure are unacceptable (e.g. affect the only water supply for a community).

Education and Incentive Programs

Canada-Ontario Environmental Farm Plan

The Environmental Farm Plan (EFP) is a program that is delivered locally through the Ontario Soil and Crop Improvement Association with expertise provided by the Ontario Ministry of Agriculture and Food. It is a voluntary educational program for farmers delivered through local workshops. Participants are provided instruction on how to progress through the risk assessment and action plan development contained in the EFP workbook. Limited funds (either a 50/50 or 30/70 cost share depending on project) are available to help address areas identified in the plan as needing improvement.

The risk assessment gives the farmer the opportunity to rate the current level of environmental concern in up to 23 different worksheets/ topic areas on the farm. The worksheet relevant to this drinking water source protection initiative is the *treatment of household waste.*

Ontario Drinking Water Stewardship Program

Landowners with property near municipal wells and surface water intakes can help protect those sources of drinking water supplies. In order to help landowners take action, the provincial government has created the Ontario Drinking Water Stewardship Program. It provides grants to help pay for a variety of projects that protect municipal water supplies from contamination. Grants have been available to help maintain or upgrade septic systems in the Thames-Sydenham Region through the Early Actions Program. This program was focused on eligible activities (including septic system upgrades) in eligible areas (WHPA-A, IPZ-1 and 2 year time of travel areas or preliminary WHPA-B as endorsed by councils). Although this program is nearing its completion the Conservation Authorities in the region have applied for funding through the Early Response

Program. This program, if applications are successful, would target significant threats as identified in the Assessment Reports.

Clean Water Program

The Clean Water Program (CWP) is a rural water quality initiative that provides technical assistance and financial incentives to improve and protect water quality on private property. Currently the following municipalities participate in this program: Oxford County, Middlesex County and Perth County. Septics are eligible in Oxford, Middlesex, City of London, and upstream of Stratford (Upper Avon watershed) but not in St. Marys or Perth County with the exception of the Upper Avon watershed. Though Perth County contributes to Erosion Control, Well Upgrades and Well Decommissioning, septic related upgrades are not eligible within the County. St. Mary's has participated in this program in the past, however, in 2010 did not contribute.

Local municipalities are offering cost-sharing grants to qualified landowners for best management practices that improve ground and surface water quality. The grant rate for all projects is 50% and range from a maximum of $500 - $5,000, depending on the project type. Septic systems are covered at a cost-share rate of 50% to a maximum of $4,000.

Land Use Planning

Municipalities can impose greater setbacks from water bodies through their official plans and zoning by - laws than what is required in the Ontario Building Code and have the ability to develop Official Plan policies related to certain aspects of septic systems and implementation of policies through provisions of the Zoning By-Law.

A majority of the municipalities require a minimum 30 m setback from waterbodies for development (including septic systems). The intent of the water setback is to provide a buffer of undisturbed soil and vegetation along the shoreline, which will help to filter runoff, prevent soil erosion, and provide wildlife habitat. In some cases a there are also situations where even greater water setbacks are required to protect sensitive lake trout populations in what are called at-capacity lake trout lakes.

Oxford County has existing Official Plan policies relating to the protection of groundwater and specifically, policies pertaining to septic systems. The policies of the Oxford County Official Plan state that policies related to source protection will remain in place until such time as the Plan is amended to incorporate approved Source Protection Plans. These policies include the prohibition of certain activities within certain vulnerable areas identified in the Official Plan. Listed within the prohibited uses and activities is "New development utilizing a private septic system and. or private well within the 100-metre (328 feet) radius or the 0 – 2 year time-of –travel zone, excluding farm severances in accordance with Section 3.1.4.4 provided that the zoning by-law or other development controls prohibit the establishment of buildings or structures within this area".

Septic System Re-inspection Programs

Septic system re - inspection programs can be used to locate faulty and failed septic systems, and to require their repair or replacement in order to improve effluent quality.

The *Ontario Building Code Act* has been amended, effective January 2011, to require municipalities to develop and implement mandatory septic system re - inspection programs for significant threats (i.e areas with a vulnerability score of 10) and voluntary programs elsewhere.

Mandatory onsite sewage maintenance inspections

- Mandatory maintenance inspection program will be required where on-site sewage systems subject to the Building Code Act have been identified as a significant drinking water threat in vulnerable areas identified in the most recent Assessment Report under the Clean Water Act.
- Inspections of on-site sewage systems are to be conducted no later than:
    - 5 years after the date on which the notice of approval of the assessment report is published on the Environmental Bill of Rights Registry
    - Every 5 years after the most recent inspection of the sewage system.

- If an inspection indicates that a septic system is not functioning as designed, the Building Code provides the authority for inspectors to issue an order for maintenance, replacement or upgrading where necessary, to ensure they continue to protect drinking water sources.
- The regulation also authorizes principal authorities (municipalities, health units, or conservation authorities) to accept certificates from property owners as an alternative to conducting inspections under mandatory or discretionary on-site sewage system maintenance inspection programs. These certificates must be in a form approved by the Minister of Municipal Affairs and Housing and be signed by a qualified person as set out in the regulation.
- Both the mandatory and discretionary programs would be enforced by principal authorities under the Building Code. The enforcement of the maintenance inspections programs will be fully funded by the principle authority responsible for the designated areas. Under the Building Code, enforcement bodies may charge fees to recover costs of the inspection programs.

Discretionary inspection program

- "Discretionary" – pertains to the discretion of the principal authority to include additional areas under their maintenance inspection program. It does not mean that the landowner can choose whether to complete the re-inspection.
- MMAH has made the "discretionary" program flexible – it is up to the principal authority to decide where it applies and to establish timeframes for re-inspection.
    - Principal authorities have the discretion to include additional areas (beyond what is included in the mandatory requirements) within an inspection program.
    - Timeframes for re-inspection of on-site sewage system that fall under the discretionary program are flexible and do not have to follow the same timelines as the mandatory program. It is at the discretion of the principal authority to set these timeframes.

Other Regional Examples (United States)

In Pinellas County, USA, all new non-residential discharges, new non-residential activities, and installations are prohibited subject to conditions including but not limited to the following: commercial or industrial septic tank disposal systems are prohibited in the zone of protection; new single-family residential septic tanks are exempt from this article, provided they meet the minimum criteria of one unit per two acres. Prohibited Uses include land divisions resulting in high density (>1 unit/acre) septic systems within Zone 1, the 6- month time-of-travel zone. (NOTE: this is typically within about 1000 feet of the public water supply well), unless granted a special exception.

In Oregon, owners of septic systems within the Drinking Water Plan area are required to have their septic system inspected within one year of the ordinances effective date and every five years thereafter. Aerobic septic systems, which pose a lesser threat to water quality, are required for new developments in the floodplain as part of public heath protection standards.

Gaps in existing legislation, policies and programs

- The Ontario Building Code re-inspection program is mandatory for septics identified as significant threats only.
- The *Ontario Building Code* does not have requirements for bacteria, nitrate and phosphorus control. It is focused on oxygen demand and suspended solids. Nitrate and phosphorus both have implications for enriching our surface water bodies, causing eutrophication. Eutrophied waters have more algae blooms which could produce toxins, interfere with drinking water treatment processes, and cause taste and odour issues. Nitrate is a direct drinking water concern in both surface water and groundwater as well.
- The other chemicals of concern related to septic systems are not treated by the systems in any way and if remain suspended or dissolved in the water would be discharged into the septic bed.

5. Policy Considerations

- *Clean Water Act* Part IV tools which include interim risk management plans, risk management plans, prohibition, and restricted land uses cannot be used for sewage systems, which include onsite sewage treatment and storage systems. The *Ontario Water Resources Act* or the *Building Code Act* provides the authority for source protection plan policies to address both existing and future threats. In addition, a policy could rely on land use planning for future occurrences.
- It is the "discharge from the system" that poses a risk to drinking water (as set out in the tables of Drinking Water Threats, which are part of the Director's Technical Rules: Assessment Report.) The septic system itself is a risk management measure, because when it is functioning properly, it reduces or eliminates pathogens in the discharge from septic systems. Therefore, an inspection to find out if a septic system is functioning may be all that is needed to determine whether it "ceases to be" a significant drinking water threat. The standards for the design, installation and proper maintenance of a septic system are set out in Ontario's Building Code. (MOE bulletin, Jan. 2011)
- The density of septic systems is not a factor as prescribed by MOE in source water protection drinking water threats. In an identified drinking water issue, density could be a consideration in source protection policies. However, the Thames-Sydenham Region has not identified any issues contributing areas in the Assessment Report for the first round of policy development. Evolving and changing environmental planning standards take density into account to varying degrees.
- The Planning Act has evolved and new standards are in place. With new development a holding tank is generally the last option.
- The Oxford Public Health Department feels that generally 'new' properly functioning systems are not of concern; it is the old septic systems that are of concern. It sees the septic system maintenance program as being instrumental in implementation of the SPPs and wishes to see emphasis placed on this.
- From Oxford County's experience, there are concerns associated with tertiary systems as they tend to fail more frequently. The advantage of the tertiary system is that they require less space, however, where possible, traditional systems are the preferred option, as tertiary systems are high maintenance. They require a service agreement which means there is an annual cost associated with the system. Also the peat in these systems must be changed regularly which is an additional cost. Some people are inclined to avoid proper maintenance because of the cost.
- For large septic systems, the OWRA, considers impact on receiving water body or groundwater assessed as part of approval process. Certificate of Approvals are issued with conditions under Section 53 of OWRA. If prohibited in Source Protection Plan, applications are not processed by MOE.
- If the SPC drafts a policy relating to a septic system covered under OWRA (large system), the policy can only address matters which would be within the legal limitation of that Certificate of Approval (C of A)/prescribed instrument. As C of A's do not set out inspection timelines, or have the legal ability to do so, the SPC can not require that the C of A include provisions surrounding inspection frequency. However, the ministry has an internal program policy to enforce compliance. MOE field staff (i.e., "Environmental Officers") from the Ministry's local District Offices typically undertake annual inspections at a subset of sewage facilities located within their geographic area of responsibility. These inspections would cover a range of sewage facilities; including smaller holding tanks and septic systems with a capacity greater than 10,000 L/day (less than 10,000 L/day are covered by the Building Code). MOE field staff may also carry out site visits/inspections of sewage facilities in response to complaints or reports of non-compliance, spills or other environmental concerns. Where issues of non-compliance with regulatory requirements (OWRA and associated regulations and any requirements associated with the terms and conditions of the site's C of A) are identified, Environmental Officers have the authority to require the facility owner/operator to take action to bring the facility into compliance. (personal communication, MOE liaison, Jan, 2011)

6. *Proposed policy ideas*

For discussion purposes, this section of the report provides examples of policy ideas that could be applicable to on - site sewage treatment and storage systems. It is not an exhaustive list. The examples are categorized by the size of septic systems and types of policy tools that can be used to meet the source protection plan objectives.

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

Sub- Threat Sewage System or sewage works- septic system

Circumstance

- Septic system is subject to the OWRA (enforced by MOE) for new or existing sewage works over 10,000 L/day.
- Septic systems with less than 10,000 L/day where the components of the system are not all located on the same parcel of land are also subject to the OWRA.
- Septic system with holding tank subject to OWRA.
- In a WHPA with a vulnerability score of 10, where the release of Acetone, Chloride, Dichlorobenzene, Nitrogen and Sodium, or Pathogens from the septic systems represent a significant threat.

Policy Tool	Policy ideas
Education and Outreach	• Education programs for large systems users on the Best Management Practices for on-site sewage maintenance, and impacts of system on drinking water. • 2 target audiences to include both system owners and system users • Focus on significant threats and look into possibilities of distributing as part of Certificate of Approvals package (may not get to all users this way). • Include other information within package not identified as significant threats (i.e. keeping pharmaceutical inputs out of septic) • Co-ordinate drinking water message with existing septic information as distributed by health units, municipalities and MOE. Address moderate and low threats with area-wide messaging.
Incentive Programs	• Should cost-share programs cover large septic systems?
Land Use Planning	• Land use restrictions for future occurrences • By-laws requiring mandatory hook-up where sewer lines are available for connection in vulnerable areas. This could likely be achieved via the Municipal Act rather than land use planning. • Review minimum lot size requirements in vulnerable areas through zoning. • OP policies addressing new severances in vulnerable areas.
Prescribed Instruments	• Prohibit new large systems in areas with a vulnerability score of 10, and applications for Certificate of Approval will not be processed by MOE under the OWRA. • Require an amendment to an existing Certificate of Approval with either policy details about how the activity should be managed or outcomes to be achieved such as:

	• Separation distances • Operation and Maintenance standards • Reduction in effluent concentrations • Information management (local municipal data base) • Monitoring and Sampling • Advancing technologies • Development of System Management Plan • Groundwater investigation • Reed bed, Constructed or engineered wetlands • Proper waste disposal following leak or spill • Restrict to certain site conditions: lot size, soil depth and type, proximity to surface • (Consult MOE prior to using this tool) • More general statement that measures must be taken to ensure activity ceases to be a significant drinking water threat. • Require approval agency to compare records with vulnerable area mapping. • Require spills protocol for holding tanks.
Municipal Operations/ Infrastructure	• Municipalities should consider extension of sewers in areas with a vulnerability score of 10 as first priority.

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

Sub- Threat Sewage System or sewage works- septic system

Circumstance

- Septic system is regulated under the Ontario Building Code for new or existing sewage works less than 10,000 L/day.
- Septic system with holding tank regulated under the Ontario Building Code
- In a WHPA with a vulnerability score of 10 where the release of pathogens from the septic systems represents a significant threat.

Policy Tool	Policy ideas
Education and Outreach	• Education programs for septic landowners on the Best Management Practices for on-site sewage maintenance, and impacts of systems on drinking water. • Focus on significant threats and tie in with septic re-inspection program as one-on-one education. • Can include other information within package not identified as significant threats (i.e. keeping chemical and pharmaceutical inputs out of septic) • Co-ordinate drinking water message with existing septic information as distributed by health units, and/or municipalities. Address moderate and low threats with broader vulnerable area-wide messaging.

Incentive Programs	• Existing cost-share program for landowners to upgrade or replace failing septic systems are supported and encouraged to continue. • Encourage all municipalities where significant threats may occur to support Clean Water Program or other incentive programs. • Encourage province to continue with Ontario Drinking Water Stewardship Program septic funding for problems indentified under re-inspection program. Limitations may be set for time frames (e.g. five years) or for first inspections. • Suggest cost-share programs also fund connecting into existing sewer infrastructure and decommissioning septics.
Land Use Planning	• Where septic systems exist in an area with a vulnerability score of 10 and where there is municipal sewage service available to the property, the municipality should pass a bylaw requiring the decommissioning of the septic system and require hookup to the municipal service. (Perhaps better included under other tools?) • Recommend OP policies addressing severances in vulnerable areas. Review minimum lot size requirements and update in accordance with provincial guidance. Or consider a more specific requirement that in WHPAs and IPZ with a vulnerability score of 10, the municipality shall not allow the creation of new unserviced lots under the size of 1 acre. • In areas with a vulnerability score of 10 and an existing lot of record exists the approval agency for septic systems should consider options including advanced treatment systems. A geo-technical study could be asked for to ensure that the proposed design option, lot size etc. is appropriate.
Prescribed Instruments	• Require mandatory re-inspection program for significant threats similar to that which is required through Ontario Building Code. Encourage re-inspection programs in moderate and low threat areas. • Suggest a targeting of areas where septic failures within vulnerable areas where septic systems are a significant threat and where there are known septic failures. Further emphasis on re-inspection should be placed on areas where older systems are more prevalent. • Inspection programs should be aware that while a septic system may have been in compliance with separation distances when built, encroachment may result in the system being out of compliance when inspected. These situations will need to be rectified so that systems which may be significant threats are in compliance with applicable standards.
Municipal Operations/ Infrastructure	• Municipalities should consider extension of sewers in areas with a vulnerability score of 10 as first priority. This would be best included as a strategic action policy. It is intended that these areas should be identified as priorities and that this additional priority should be considered by senior levels of government in providing infrastructure grants.

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Appendix A – tables

Table 1 - Number of enumerated locations of potential significant threats

Septic Systems and Holding Tanks

System	Type	Vulnerable Area	Vulnerability Score	Number of Locations of Waste Threats	Number of septic locations	Sub-threat description
Birr	Pathogen	WHPA-A	10	11	11	Septics
Dorchester	Pathogen	WHPA-A,B	10, 6	55	55	septics, sanitary sewers
City of London-Fansh	Pathogen	WHPA-A	10	2	2	Septics
Melrose	Pathogen	WHPA-A, B	10	21	21	Septics
Thorndale	Pathogen	WHPA-A	10	5	5	Septics
Beachville	Pathogen	WHPA-A	10	6	NA	NA
Embro	Pathogen	WHPA-A	10	19	NA	NA
Hickson	Pathogen	WHPA-A	10	9	NA	NA
Ingersoll	Pathogen	WHPA-A, B	6, 8, 10	11	7	4 sanitary sewers, 7 on-site septics
Lakeside	Pathogen	WHPA-A	10	5		NA
Mount Elgin	Pathogen	WHPA-A	10	12	12	12 on-site septics
Tavistock	Pathogen	WHPA-A	10	1	0	1 sanitary sewer
Thamesford	Pathogen	WHPA-A, B	6, 8, 10	3	1	1 septic, 2 sanitary sewers
Woodstock-urban	Pathogen	WHPA-A	10	2	NA	2 waste disposal sites
Woodstock-rural	Pathogen	WHPA-A, B	6, 10	186	186	186 on-site septics res/agric
St.Marys	Pathogen			5	4	1 waste disposal site, 8 septic systems
Highgate	NA (Pathog	WHPA-A	10	25	25	Septic
Ridgetown	NA (Pathog	WHPA-A	10	5	5	NA
				388	334	

Table 2a - Areas Where Septic and Holding Tanks can be Drinking Water Threats

Intake Protection Zones				Vulnerable Area and Score									
				IPZ-1					IPZ-2				
Level of Threat	Type of Threat	Activity	Circumstance	9	8	7	6	5	7.2	6.4	6.3	5.6	4.8, 4.2, 4
Significant	Chemical	Holding Tank	Large	N	N	N	N	N	N	N	N	N	N
	Chemical	Holding Tank	Small	N	N	N	N	N	N	N	N	N	N
	Chemical	Septic system	Large	N	N	N	N	N	N	N	N	N	N
	Chemical	Septic system	Small	N	N	N	N	N	N	N	N	N	N
	Pathogen	Holding Tank	Large	N	N	N	N	N	N	N	N	N	N
	Pathogen	Holding Tank	Small	N	N	N	N	N	N	N	N	N	N
	Pathogen	Septic system	Large	N	N	N	N	N	N	N	N	N	N
	Pathogen	Septic system	Small	N	N	N	N	N	N	N	N	N	N
Moderate	Chemical	Holding Tank	Large	Y	N	N	N	N	N	N	N	N	N
	Chemical	Holding Tank	Small	N	N	N	N	N	N	N	N	N	N
	Chemical	Septic system	Large	Y	N	N	N	N	N	N	N	N	N
	Chemical	Septic system	Small	N	N	N	N	N	N	N	N	N	N
	Pathogen	Holding Tank	Large	Y	Y	N	N	N	N	N	N	N	N
	Pathogen	Holding Tank	Small	Y	Y	N	N	N	N	N	N	N	N
	Pathogen	Septic system	Large	Y	Y	N	N	N	N	N	N	N	N
	Pathogen	Septic system	Small	Y	Y	N	N	N	N	N	N	N	N
Low	Chemical	Holding Tank	Large	Y	Y	Y	Y	N	Y	Y	Y	N	N
	Chemical	Holding Tank	Small	Y	Y	Y	N	N	Y	N	N	N	N
	Chemical	Septic system	Large	Y	Y	Y	Y	N	Y	Y	Y	N	N
	Chemical	Septic system	Small	Y	Y	Y	N	N	Y	N	N	N	N
	Pathogen	Holding Tank	Large	N	N	Y	Y	N	Y	Y	Y	Y	N
	Pathogen	Holding Tank	Small	N	N	Y	Y	N	Y	Y	Y	Y	N
	Pathogen	Septic system	Large	N	N	Y	Y	N	Y	Y	Y	Y	N
	Pathogen	Septic system	Small	N	N	Y	Y	N	Y	Y	Y	Y	N

NOTE:

Various chemicals are identified as checmials of concern which would lead to a drinking water threat depending on the threat or the sub-category and the circumstances involved with the activity. These include such chemicals as acetone, chloride, Dichlorobenzene, Nitorgen, Phosphorus, Sodium

Large systems are those which require approval under the Ontario Water Resouces Act. These systems require a Certificate of Authorization from the Ministry of the Environment.

Small systems are those systems which require approval under the Building Code

Table 2b - Areas Where Septic and Holding Tanks can be Drinking Water Threats

WellHead Protection Area				Vulnerable Area and Score								
				WHPA-A	WHPA-B			WHPA-C			WHPA-D	
				10	10	8	6	8	6	4	6	4, 2
Significant	Chemical	Holding Tank	Large	Y	Y	N	N	N	N	N	N	N
	Chemical	Holding Tank	Small	Y	Y	N	N	N	N	N	N	N
	Chemical	Septic System	Large	y	Y	N	N	N	N	N	N	N
	Chemical	Septic System	Small	N	N	N	N	N	N	N	N	N
	Pathogen	Holding Tank	Large	Y	Y	N	N	N	N	N	N	N
	Pathogen	Holding Tank	Small	Y	Y	N	N	N	N	N	N	N
	Pathogen	Septic System	Large	Y	Y	N	N	N	N	N	N	N
	Pathogen	Septic System	Small	Y	Y	N	N	N	N	N	N	N
Moderate	Chemical	Holding Tank	Large	N	N	Y	N	Y	N	N	N	N
	Chemical	Holding Tank	Small	N	N	Y	N	Y	N	N	N	N
	Chemical	Septic System	Large	N	N	Y	N	Y	N	N	N	N
	Chemical	Septic System	Small	Y	Y	Y	N	Y	N	N	N	N
	Pathogen	Holding Tank	Large	N	N	Y	N	Y	N	N	N	N
	Pathogen	Holding Tank	Small	N	N	Y	N	Y	N	N	N	N
	Pathogen	Septic System	Large	N	N	Y	N	Y	N	N	N	N
	Pathogen	Septic System	Small	N	N	Y	N	Y	N	N	N	N
Low	Chemical	Holding Tank	Large	N	N	N	Y	N	Y	N	Y	N
	Chemical	Holding Tank	Small	N	N	N	Y	N	Y	N	Y	N
	Chemical	Septic System	Large	N	N	N	Y	N	Y	N	Y	N
	Chemical	Septic System	Small	N	N	N	Y	N	Y	N	Y	N
	Pathogen	Holding Tank	Large	N	N	N	Y	N	Y	N	Y	N
	Pathogen	Holding Tank	Small	N	N	N	Y	N	Y	N	Y	N
	Pathogen	Septic System	Large	N	N	N	Y	N	Y	N	Y	N
	Pathogen	Septic System	Small	N	N	N	Y	N	Y	N	Y	N

NOTE:

Various chemicals are identified as checmials of concern which would lead to a drinking water threat depending on the threat or the sub-category and the circumstances involved with the activity. These include such chemicals as acetone, chloride, Dichlorobenzene, Nitorgen, Phosphorus, Sodium

Large systems are those which require approval under the Ontario Water Resouces Act. These systems require a Certificate of Authorization from the Ministry of the Environment.

Small systems are those systems which require approval under the Building Code

Draft Policies

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.

Policy Number	1
Sub- Threat(s)	Sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system over 10,000 L/day and septic system with holding tank subject to OWRA
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE – through OWRA
Threat Status	Existing
Land Use	All
Legal Effect	Conform
Policy Tool	Prescribed instrument – OWRA
Policy	Measures must be taken within the Certificate of Approval (C of A) program to ensure an existing large septic system ceases to be a significant threat. In order to ensure that these systems are adequately managed the MOE must implement a review of the Certificate of Approval within the areas where these systems may be significant drinking water threats and develop a re-inspection program for the inspection of these systems. The re-inspection program shall determine that the systems function as designed, they meet current applicable design standards and that the systems are being properly maintained. The re-inspection of septic systems within areas with a vulnerability score of 10 shall be first priority. Areas where known septic failures have been identified shall be made a priority within the re-inspection program. Areas where older systems which have not recently been inspected shall also be identified as priorities within the re-inspection program. Systems found to be deficient shall be required to undertake improvements to be in compliance.
Implementation schedule	The re-inspection program shall be established within a 2 year period from the approval of the source protection plan with a completion of the inspection of systems in these areas within 5 years of the initiation of the re-inspection program.
Monitoring Policy	MOE to report to SPA in a manner acceptable to the SPA. The report shall include: the number of existing septic C of As within vulnerable areas which are significant drinking water threats, amendments that were made to existing C of As to reduce risk presented by these significant threat. The report shall also include the number of existing C of As that have been identified through re-inspection as being properly functioning and those required to make upgrades. This report shall be submitted in 2 years from the approval of the Source Protection Plan and annually from then on.

Policy Number	2
Sub- Threat(s)	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system over 10,000 L/day subject to OWRA and septic system with holding tank subject to OWRA
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE – through OWRA
Threat Status	Expanding and Future
Land Use	All
Legal Effect	Conform
Policy Tool	Prescribed instrument – OWRA
Policy	All Certificate of Approvals issued must include management details to ensure the activity never becomes a significant threat. New or expanding systems shall be the subject of re-inspection every 5 years from the issuance of the C of A.
Implementation schedule	Immediately upon approval of the SPP
Monitoring Policy	Report on any new Certificate of Approvals issued within vulnerable areas with a score of 10 annually.

Policy Number	3
Sub- Threat(s)	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system over 10,000 L/day subject to OWRA and septic system with holding tank subject to OWRA.
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE – through OWRA
Threat Status	Expanding and Future
Land Use	All
Legal Effect	Strategic Action
Policy Tool	Prescribed instrument – OWRA
Policy	Certificates of Approval for septic systems should be discouraged for proposed septic systems within WHPA–A or B with a vulnerability score of 10.
Implementation schedule	
Monitoring Policy	Report on number of C of A applications within vulnerable areas, the number issued and the number denied. This report shall be submitted within 2 years of the approval of the Source Protection Plan and annually thereafter.

Policy Number	4
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code*
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Issuer of approval of septic systems under the building code (generally Municipality or Health Unit)
Threat Status	Existing
Land Use	All
Legal Effect	Conform
Policy Tool	Other: *Ontario Building Code*
Policy	a. The *Ontario Building Code* requires onsite septic inspections every five years for existing systems that are identified as significant threats. The first round of inspections will be phased in over a 5 year period. Priority should be given to inspect the oldest systems and those closest to the well head first with a priority on areas where failures are most suspected. b. Where the re-inspection program locates faulty and failed septic systems, the inspector shall require the maintenance, repair or replacement of the system to ensure that it functions as designed and meets current applicable design standards thus ensure that the threat ceases to be significant.
Implementation schedule	As per OBC (within 5 years)
Monitoring Policy	Municipalities shall provide an annual report on the results of the septic system inspection program, including the number of inspections, the number of failures and remediation notices, the number of system pump-outs and compliance orders issued. The report shall be in a format acceptable to the SPA. The first report to be submitted within 2 years of approval of the Source Protection Plan and annually thereafter.

Policy Number	5
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code*
Vulnerable Area	WHPAs with a vulnerability score of 6-8, IPZs with a vulnerability score of 5.6 - 9.0
Risk	Moderate and Lows
Body Responsible for Implementing	Municipality, Health Unit
Threat Status	Existing
Land Use	Residential, Agricultural
Legal Effect	Strategic action
Policy Tool	Other: *Ontario Building Code*
Policy	Discretionary septic re-inspection programs as outlined in the *Ontario Building Code* are encouraged to include moderate and low threat septic systems. However, inspection of significant threats should remain the first priority. Discretionary re-inspection programs to give priority to low and moderate threats within WHPA and IPZ and then HVA. Priority should be given to areas where septic failures are known to occur and where older septic systems are more predominant.
Implementation schedule	As soon as possible following the implementation of the mandatory re-inspection program (as determined by the local approval agency). Where mandatory re-inspection is not required the municipality encouraged to initiate the program within 5 years of the approval of the Source Protection Plan. It is anticipated that this policy would be given more weight in subsequent Source Protection Plan with legal affect increased to having regard for.
Monitoring Policy	Where discretionary inspection programs are implemented, an annual report is to be submitted to the SPA identifying the results of the septic system inspection program, including the number of inspections, the number of failures and remediation notices, the number of system pump-outs and compliance orders issued. The report could be combined with that which is required for mandatory inspection programs. Municipalities not initiating a discretionary inspection program shall report to the SPA on their intent and considerations related to the program.

Policy Number	6
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code*
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	All
Legal Effect	Conform
Policy Tool	Land Use Planning
Policy	Official Plan policies and bylaws shall address new severances in vulnerable areas to ensure septic systems and holding tanks do not become a significant threat. Minimum lot size requirements shall be updated in accordance with provincial guidance.
Implementation schedule	To be updated in all Official Plans within 2 years of the Source Protection Plan approval date and bylaws within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA on new policies incorporated in Official Plans and any new by-laws relevant to source water protection. All municipalities must report even if it is to indicate that no changes were required. Where no changes were required, the report is to describe how the existing OP and bylaws meet the requirements of this policy.

Policy Number	7
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	Septic system under 10,000 L/day regulated by *Ontario Building Code* and septic system over 10,000 L/day subject to OWRA; including holding tanks.
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	Residential, Agricultural
Legal Effect	Have regard
Policy Tool	Land Use Planning
Policy	OP policies shall discourage the installation of new septic systems and holding tanks within areas with a vulnerability score of 10. They shall do this through restrictions on lot sizes, allowable land uses, and required hook-up to sanitary sewers where available these areas.
Implementation schedule	OP changes shall be made within 2 years of the approval of the Source Protection Plan.
Monitoring Policy	Report to the SPA on the changes in OP implemented or planned regarding septic systems and holding tanks. Report annually on number of permits issued for new septic systems within vulnerable areas.

Policy Number	8
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	Septic system under 10,000 L/ and septic system holding tanks day regulated by *Ontario Building Code*
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	Residential
Legal Effect	Conform
Policy Tool	Land Use Planning/Other bylaws
Policy	Where municipal sewage services exist in areas with a vulnerability score of 10, municipal by-laws shall require the decommissioning of any existing septic systems or holding tanks and require mandatory hook-up to the municipal service.
Implementation schedule	To be updated in all Official Plans within 2 years of the Source Protection Plan approval date and bylaws within 3 years of the Source Protection Plan approval date.
Monitoring Policy	The municipality shall report to the SPA annually on the number of septic systems which could be hooked up and the number which have been hooked up.

Policy Number	9
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	Septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code* and systems over 10, 000 L/day and holding tanks subject to the OWRA
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic Action
Policy Tool	Other
Policy	When planning extension of sewer services, municipalities should consider areas with a vulnerability score of 10 as first priority. Where the costs are beyond the capabilities of the municipality and landowner the senior levels of government should be encouraged to provide funding to offset the cost to the rate payer through an infrastructure funding programs.
Implementation schedule	Immediately upon approval of the SPP
Monitoring Policy	Municipalities to report to the SPA annually any new sewer lines installed or planned within the vulnerable areas.

Policy Number	10
Sub- Threat	sewage system or sewage works – septic system
Circumstance	Septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code* and systems over 10, 000 L/day and holding tanks subject to the OWRA
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality, Conservation Authority, MOE
Threat Status	Existing and Future
Land Use	All
Legal Effect	Conform or Have Regard??
Policy Tool	Incentives
Policy	a. All municipalities, where septic systems present significant threats to drinking water sources, are required to support the Clean Water Program or a similar incentive programs to subsidize the cost to septic owners where upgrades have been identified as mandatory to reduce significant threats. b. Ontario Drinking Water Stewardship program is required to share the funding of these programs equally with the municipalities. c. Incentive funding shall be required for 5 years or until the time when all significant threat septic system inspections have occurred.
Implementation schedule	Upon approval of the Source Protection Plan and for a period of 5 years following or until all significant threats identified in the Assessment Report have undergone a septic re-inspection. To be included in municipal budgets in the first calendar following the approval of the Source Protection Plan.
Monitoring Policy	Conservation Authorities to report annually to SPA on number of septic grant applications, the number of eligible applications and the number of grants distributed.

Policy Number	11
Sub- Threat	sewage system or sewage works – septic system
Circumstance	septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code* and systems over 10, 000 L/day and holding tanks subject to the OWRA
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality, Conservation Authority, MOE
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic Action
Policy Tool	Incentives
Policy	a. Existing cost-share programs for septic owners (i.e. Clean Water Program, Ontario Drinking Water Stewardship Program, and Environmental Farm Plan), are supported and encouraged to continue. b. Funding is encouraged to be available for faulty septic systems identified through re-inspection programs. c. Programs shall be encouraged to give priority to actions proposed in vulnerable areas and which will manage significant drinking water threats
Implementation schedule	Upon approval of the source protection plan
Monitoring Policy	CA, municipal or provincial programs to report annually to SPA on number of applications for grants for septics within vulnerable areas, then number of eligible for grants and the number of grants distributed..

Policy Number	12
Sub- Threat	sewage system or sewage works – septic system sewage system or sewage works – septic system with holding tank
Circumstance	septic system under 10,000 L/day and holding tanks regulated by *Ontario Building Code* and systems over 10, 000 L/day and holding tanks subject to the OWRA
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant, moderate and low
Body Responsible for Implementing	Conservation Authorities, in partnership with Municipalities, Health Units, and MOE
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Conform for significant-Strategic Action for Moderate/low??
Policy Tool	Education and Outreach
Policy	a. An education package shall be produced providing best management practices for septic system and holding tank maintenance that considers threats to drinking water sources. This information shall be distributed to all septic systems identified as being a significant threat through the re-inspection program for small septic systems and through the Certificate of Approvals process for septic systems subject to the OWRA. b. Co-ordinate with existing area-wide septic awareness outreach programs to include source water protection messaging. c. Consider extending education to include information regarding drinking water threats not prescribed under the CWA (e.g. pharmaceuticals)Efforts to be coordinated with other agencies with existing education programs related to septic systems.
Implementation schedule	Within 2 years of SPP approval date for the significant threats.
Monitoring Policy	Issuing agency to report to SPA on number of educational packages distributed with re-inspection program or Certificates of Approval.

Policy Number	13
Sub- Threat	All
Circumstance	
Vulnerable Area	
Risk	Significant
Body Responsible for Implementing	All
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Must comply
Policy Tool	Monitoring
Policy	
Implementation schedule	
Monitoring Policy	All monitoring and reporting shall be reported in such a manner that it can be summarized on a municipal and vulnerable area basis.