

Summary of Groundwater Protection Policies: Cataraqui Source Protection Plan (November 2014)

Purpose

This document has been prepared to summarize policies in the Cataraqui Source Protection Plan (the Plan) that are intended for groundwater protection across the Cataraqui area of southeastern Ontario.

The Plan was approved by the Ontario Ministry of the Environment and Climate Change in November 2014. It becomes effective on April 1, 2015. The Plan serves to help protect the source water for municipal residential drinking water supplies and sensitive groundwater areas across the Cataraqui area (see <http://cleanwatercataraqui.ca/cataraqui-source-protection-plan-explanatory-document/>). The Plan was prepared by the multi-stakeholder Cataraqui Source Protection Committee based on technical studies and extensive consultation. It includes responsibilities and recommendations for provincial ministries, municipalities, the Cataraqui Source Protection Authority and others.

This document summarizes policies from Chapters 4 and 5 of the Plan that fill knowledge gaps and improve protection of regionally sensitive groundwater sources. It does not include the policies that have been written for the wellhead protection areas at Cana (Kingston Mills), Lansdowne and Miller Manor Apartments (Mallorytown).

Groundwater in the Cataraqui Source Protection Area

Highly vulnerable aquifers (HVAs) and/or significant groundwater recharge areas (SGRAs) were identified across about 93 per cent of the Cataraqui Source Protection Area (CSPA) as shown on the map below (Figure 1). The [Groundwater Vulnerability Analysis Report for the Cataraqui Source Protection Area](#) (Dillon Consulting Ltd, August 2008) outlines analysis methods and findings. In short, the geological character (fractured bedrock at or near surface) of the Cataraqui Source Protection Area is such that little natural protection of underlying aquifers is present and recharge is widespread.

All source protection plans are made pursuant to the *Clean Water Act*. The Act requires that source protection plans include policies to address all activities that are ranked as significant drinking water threats. There are only six locations (less than 1 per cent of the total area) within the CSPA where significant drinking water threats can or do occur. The Cataraqui Source Protection Committee believes that it is not only important to include policies in the Plan to fill gaps in existing water protection frameworks for the significant drinking water areas, but for other vulnerable locations as well. Policies applicable to the regionally sensitive groundwater areas (HVAs and SGRAs) are intended to fill knowledge gaps, improve data sharing, encourage refinement of regional delineations and protect groundwater from activities that could be impair it.

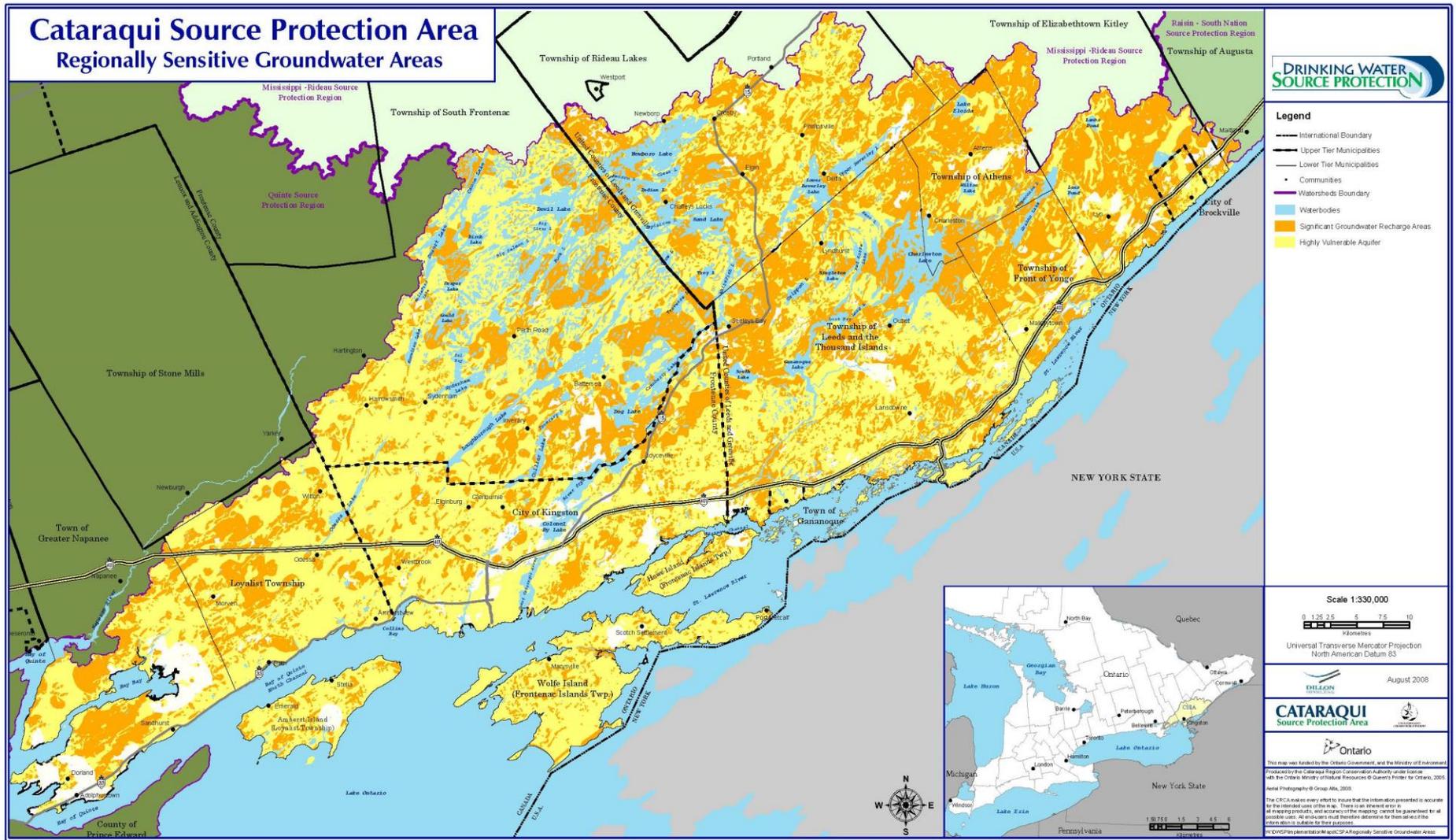


Figure 1. This map of the Cataraqui Source Protection Area (CSPA) indicates the highly vulnerable aquifers (HVAs) and the significant groundwater recharge areas (SGRAs) highlighted in yellow and orange, respectively. HVAs and SGRAs have been identified across approximately 93% of the CSPA.

Groundwater Policies for Regional Consideration

The table below displays key policies in the Cataraqui Source Protection Plan (the Plan) applicable to regionally sensitive groundwater areas where research and collaboration are necessary or beneficial for successful implementation. Most of these policies are non-binding (marked ‘NB’) in that implementers are not legally compelled to act. However, land use planning decision-makers must “have regard to” Policy 5.5.1-HR, which in this context means that they must carefully consider the policy and have valid reasons for related decisions.

Each of these policies is presented and described in more detail below using information from the Plan and companion Explanatory Document. The Plan includes a broad range of policies to protect regionally sensitive groundwater areas. Appendix ‘A’ displays a sub-set of policies that could be of interest to those agencies and organizations concerned with research and/or regional planning.

Policy Number	Topic	Implementation Timeline (years following the effective date)
4.6.1-NB	Research on sewage system and well separation	10 years
4.6.2-NB	Research on proper disposal method for discharge from water softeners	5 years
4.7.3-NB	Management of hauled sewage (innovative local stabilization)	5 years
5.2.1-NB	Protecting groundwater in rural settlement areas (water contributing area identification)	1 year
5.3.1-NB	Compilation and organization of groundwater data	1 year
5.5.1-HR	Land use planning and development (needed assessment guidelines)	Immediate

Policy 4.6.1-NB: Research on sewage system and well separation

On-site sewage systems are used extensively throughout the CSPA. Existing management tools used to protect groundwater from on-site sewage systems may not be sufficient in the CSPA due to the highly vulnerable nature of the groundwater. The Ontario Building Code specifies separation distances, as well as design and construction specifications. In addition, Procedure D-5-4: Technical Guideline for Individual On-site Sewage Systems: Water Quality Impact Assessment (Ontario Ministry of the Environment, 1996) provides technical guidance for private sewage systems in rural subdivisions with five or more lots. These specifications may not be enough to protect drinking water sources in hydrogeologically sensitive areas (i.e. karstic areas, areas of fractured bedrock exposed at the surface, areas of thin soil cover, and areas of highly permeable soils) like those found in the CSPA.

The research discussed in policy 4.6.1-NB could help to determine whether different separation distances are needed in sensitive groundwater areas, and could inform Code and procedural changes that would be effective and accurate for the local context in the Cataraqui Source Protection Area.

Intent	Policy
<p>Encourage the Cataraqui Source Protection Authority, in collaboration with other stakeholder groups, to consider conducting research to understand the flow of septic system effluent in fractured bedrock. Findings from the research should be used to influence decision-making and reviews of relevant codes and guidelines.</p>	<ol style="list-style-type: none"> a. To assist in identifying the best risk management measures and standards to address significant, moderate and low drinking water threats related to on-site sewage systems (i.e. septic systems and holding tanks) locally, the Cataraqui Source Protection Authority, in collaboration with the Ministry of Municipal Affairs and Housing, the Ministry of the Environment, academic institutions and other stakeholder groups should consider conducting research to determine how effluent from on-site sewage systems is transported and attenuated in fractured bedrock environments. This research is recommended to support the improvement of risk management measures for managing effluent from on-site sewage systems in fractured bedrock environments, whether they occur in wellhead protection areas, intake protection zones, highly vulnerable aquifers or significant groundwater recharge areas. b. The research should be completed within ten years of the Source Protection Plan taking effect. c. Research findings should be: <ol style="list-style-type: none"> i. Considered by the Ministry of Municipal Affairs and Housing in future reviews of the Ontario Building Code ii. Considered by the Ministry of the Environment in future reviews of provincial guidelines for water quality impact assessments for individual on-site sewage systems and iii. Shared with local municipalities and health units for use in their decision-making processes.

Policy 4.6.2-NB: Research on discharge from water softeners

Hard water is prevalent throughout the Cataraqui Source Protection Area; therefore, many people use water softeners in their homes and businesses. A literature review indicated that there is no agreement in the scientific community about the best method to dispose of water softener backwash (i.e. whether it should be discharged onto the ground or into a septic system). Although the Ontario Building Code states that water softener backwash can be disposed into a septic system if it is designed to accept it, there is no clear indication of what a proper design would be. Improperly designed septic tanks can corrode as a result of water softener backwash, or the proper settling of liquids in the septic tank can be impaired resulting in poorly treated sewage entering the environment. Research is needed to address this drinking water threat, as the Source Protection Committee believes that there is a knowledge gap.

Research under policy 4.6.2-NB could more definitively identify the most effective disposal method for water softener backwash, which could lead to the development of specific standards within the Ontario Building Code.

Intent	Policy
<p>Encourage the Ministry of the Environment and Climate Change, and the Ministry of Municipal Affairs and Housing, to research the most effective disposal method for water softener backwash discharge in the CSPA.</p>	<ol style="list-style-type: none"> a. The Ministry of the Environment and Ministry of Municipal Affairs and Housing, in cooperation with the Ontario Rural Wastewater Centre and the water softener industry, should consider undertaking a research study to determine the most effective method for disposing of water softener backwash in the hydrogeological and climatic setting of the Cataraqui Source Protection Area/Eastern Ontario to add to the risk management measures available to protect drinking water sources. Discharge from a water softener can be a significant, moderate and low drinking water threat in the wellhead protection areas and intake protection zones in the CSPA. b. The Ministry of Municipal Affairs and Housing should use the study results to analyze the need for a review of the Ontario Building Code to specify how water softener backwash should be disposed. c. A proposal to undertake this strategic action should occur within five years of the Source Protection Plan taking effect, and be shared with the Cataraqui Source Protection Authority at that time.

Policy 4.7.3-NB: Management of hauled sewage

In the Cataraqui Source Protection Area (CSPA), approximately 36 per cent (Cataraqui Source Protection Plan Explanatory Document, September 2014) of the population lives in a rural area that is not serviced by municipal water and sanitary sewers. There are also many businesses that are connected to private services. It is estimated that there are currently more than 23,000 (Cataraqui Source Protection Plan Explanatory Document, September 2014) septic systems and/or holding tanks in the CSPA, with that number expected to grow over time as new rural lots are created. As part of regular septic system maintenance, septic tanks should be pumped out at least every three to five years. This means that the volume of sewage coming from septic tanks will also increase in future.

Hauled sewage or septage is the term for the raw, untreated material that is pumped out of septic tanks. In the Cataraqui Source Protection Area, most septic pumping companies take the septage to a wastewater treatment facility where it is stabilized to reduce pathogens before it is applied to land as a biosolid. In some cases, untreated septage can be applied to land that meets provincial guidelines through an environmental compliance approval. Application of untreated septage can occur in parts of the highly vulnerable aquifers and significant groundwater recharge areas, as well as well some of the wellhead protection areas and intake protection zones. Therefore, it is important to encourage municipalities to take steps to protect the drinking water sources from untreated septage through the development of a plan to manage hauled sewage. Policy 4.7.3-NB creates the potential for a pilot project to explore the potential strategies for the stabilization (including reduction of pathogens and management of hauled sewage).

Intent	Policy
Encourage municipalities to protect drinking water sources where certain activities related to hauled sewage would be a moderate or low drinking water threat.	<ul style="list-style-type: none"> a. Where the application of untreated septage (i.e. hauled sewage) to land, sewage treatment plant effluent discharges and on-site sewage treatment systems (i.e. septic systems and holding tanks) are moderate or low drinking water threats, and there is limited or no capacity at local wastewater treatment facilities in the Cataraqui Source Protection Area, municipalities should consider taking the following actions to protect their sources of drinking water within five years of the Source Protection Plan taking effect: <ul style="list-style-type: none"> i. managing the treatment or stabilization of untreated septage at existing wastewater facilities and/or ii. upgrading existing or constructing new facilities to handle demand and/or iii. encouraging the use of alternative treatment or stabilization technologies. b. Where this policy is implemented by a municipality, the municipality should provide the Cataraqui Source Protection Authority with a timely update.

Policy 5.2.1-NB: Protecting groundwater in rural settlement areas

The primary source of drinking water in the Cataraqui Source Protection Area for individuals and communities that are not in close proximity to Lake Ontario or the St. Lawrence River is groundwater. The majority of rural settlement areas (e.g. hamlets and villages) and countryside development depend on private drinking water wells. As noted in the above policy, this affects more than one-third of the population. Historical and current land uses and practices may be affecting the quality of the groundwater that homeowners and businesses in these communities use for drinking water.

Policy 5.2.1-NB recommends that the Cataraqui Source Protection Authority provide municipalities with the information necessary for them to consider protecting drinking water sources for the long term where a municipal drinking water supply may be required in the future.

The considerations discussed in the policy include the potential for contributing area studies. Interested municipalities could commission a scoped wellhead protection area study to identify the predominant direction of groundwater flow and potential source locations. This could inform proactive land use planning and risk management measure implementation in the contributing areas around the source(s).

Intent	Policy
Encourage the Cataraqui Source Protection Authority to share information with rural settlement area municipalities to protect drinking water sources.	<ul style="list-style-type: none"> a. The Cataraqui Source Protection Authority should share the following information with municipalities of rural settlement areas that are not currently serviced by municipal water supplies to help them consider how to proactively protect the sources of drinking water for these areas: <ul style="list-style-type: none"> i. the delineation of vulnerable areas as identified in the Assessment Report ii. best management practices for the management of drinking water threats, including designating areas for the protection of drinking water sources in municipal planning documents. b. This policy should be implemented within one year of the Source Protection Plan taking effect.

Policy 5.2.3-NB: Groundwater protection information sessions for municipal officials and staff

Groundwater protection is a relatively new consideration for some municipal Councils and staff. The implementation of groundwater protection policies and principles in municipal planning documents and decisions is an important aspect of overall source water protection. Policy 5.2.3-NB recommends that the Ministry of Municipal Affairs and Housing disseminate information about groundwater protection to the municipalities in the Cataraqui Source Protection Area, in cooperation with the Ministry of the Environment and Climate Change and non-profit organizations such as Well Aware and the Ontario Groundwater Association. Other organizations and agencies may also have information and/or resources to enhance this initiative.

Intent	Policy
Encourage the Ministry of Municipal Affairs and Housing to work with the Ministry of the Environment and Climate Change and groundwater organizations to deliver information to municipalities to improve groundwater protection initiatives in vulnerable areas.	<ul style="list-style-type: none"> a. The Ministry of Municipal Affairs and Housing, in consultation with the Ministry of the Environment and groundwater focused organizations, should coordinate the delivery of information sessions targeted to municipal councils and staff that would address the importance of protecting groundwater, and provide practical ideas for implementation through land use planning and development. b. The information sessions should be offered to all municipalities within the Cataraqui Source Protection Area, and delivered within five years of the Source Protection Plan taking effect.

Policy 5.3.1-NB: Organization of groundwater data

It became evident during preparation for the Assessment Report that there was a need for more and better groundwater information in the Cataraqui Source Protection Area to fill knowledge gaps. The existing groundwater data collected by agencies in the Cataraqui Source Protection Area is one source of information that should be more widely accessible. The Cataraqui Source Protection Authority should facilitate a meeting to determine which data are available and how the data would be best organized and shared.

Intent	Policy
Encourage the Cataraqui Source Protection Authority, in cooperation with other stakeholders, to coordinate the organization of groundwater data.	<ul style="list-style-type: none"> a. The Cataraqui Source Protection Authority, in cooperation with the Ministry of the Environment, Ministry of Natural Resources, KFL&A Public Health, the Leeds, Grenville, Lanark and District Health Unit, local municipalities, and other groups, should coordinate the collection and management of groundwater data in order to be prepared to better gauge the impact of climate change on sources of drinking water within the Cataraqui Source Protection Area. b. Such a program should: <ul style="list-style-type: none"> i. establish a means by which databases may be collated, and data shared and ii. facilitate the identification of gaps in current groundwater monitoring programs. c. These bodies should work to establish this program within one year of the Source Protection Plan taking effect.

Policy 5.5.1-HR: Land use planning and development

Municipalities regulate development under the *Planning Act* and *Condominium Act*. The *Clean Water Act* (s39(1)) requires that decisions on planning matters must have regard to the moderate and low drinking water threat policies in the Plan. It will also be necessary to update planning documents to reflect the Source Protection Plan policies no later than the next five year review. Most municipalities in the CSPA have official plan policies about groundwater protection, however their applicability varies. Although most policies address the impact of on-site sewage systems on drinking water sources, only a few policies discuss other activities that could contaminate a groundwater source. It is important to strengthen existing land use planning policies by protecting sensitive regional groundwater sources from drinking water threat activities. If appropriate risk management measures are not put in place to manage specific activities in these vulnerable areas, groundwater sources could be impacted by contaminant leaks or spills.

Policy 5.5.1-HR includes consideration for land use planning provisions to account for karst formations (i.e. sinkholes, caves, and underground tunnels that form when rock is dissolved by water). An assessment guideline will be developed for policy implementation. The bedrock formations present in the CSPA, especially the west, are known to be karstic; however, precise locations and extents are not known. Karst formations create a direct link from the ground surface to the underlying aquifer, enabling any contamination on the surface to quickly reach the groundwater.

The regional highly vulnerable aquifer and significant groundwater recharge area delineations may be different from conditions found at the property-level. Policy, 5.5.1-HR therefore also includes a provision whereby a development proponent could prepare and present information to demonstrate that their subject property does not display HVA/SGRA characteristics and therefore should be relieved requirements of this policy. An assessment guideline will also be developed for this aspect of policy implementation.

Intent	Policy
To protect sensitive regional groundwater sources from contamination associated with particular types of development.	<p>a. Municipalities reviewing proposals under the <i>Planning Act</i> or <i>Condominium Act</i> for new development and for expansions to existing development located in a highly vulnerable aquifer or significant groundwater recharge area, and involving one or more of the activities listed below, should incorporate measures/management practices to adequately manage the risk to groundwater quality associated with those activities. This policy contains examples of land uses associated with these activities, which are low drinking water threats, and is not considered to be an exhaustive list.</p> <ul style="list-style-type: none"> i. the handling and storage of more than 25 litres of dense non-aqueous-phase liquids (DNAPLs) and/or organic solvents (e.g., metal manufacturing, electroplating and fabrication industries, automotive or equipment repair shops, furniture refinishing shops, dry cleaning establishments) ii. the handling and storage of more than 2,500 kilograms or litres of commercial fertilizer and/or more than 250 kilograms or litres of pesticide where it is sold or used for application at other sites, except where it is manufactured or processed (e.g., lawn and garden centres, farm supply stores, yard maintenance contractors, golf courses) iii. the handling and storage of more than 2,500 litres of liquid fuel (e.g., gas stations)

	<ul style="list-style-type: none"> iv. the handling and storage of more than 500 tonnes of road salt (e.g., public or private maintenance yards) v. at or above-grade snow storage that is more than 1 hectare in size (e.g., public or private maintenance yards, snow dumps) vi. the storage of mine tailings (e.g., mineral extraction sites) vii. the storage of PCBs (e.g., waste transfer stations) <p>b. If there is any evidence of surface karst formations (e.g., disappearing streams, sinkholes, caves, vertical fissures) on the property, the municipality should require the developer to have a karst assessment completed by a karst specialist to determine what, if any, additional risk management measures may be required.</p> <p>c. This requirement could be waived if the proponent can demonstrate through a site specific investigation that a property does not exhibit characteristics of a highly vulnerable aquifer and/or significant groundwater recharge area.</p>
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More Information

Visit www.cleanwatercataraqui.ca to find a variety of resources including:

- Cataraqui Source Protection Plan and related technical studies
- Fact sheets and guides
- Maps, including clickable versions tailored to each vulnerable area for residents and municipalities
- Helpful links

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Appendix A – Additional Policies for Consideration

The table below displays additional policies in the Cataraqui Source Protection Plan applicable to regionally sensitive groundwater areas that may be of interest to your organization.

Policy Number	Topic
4.7.1-NB, 4.7.2-NB	Salt management plans
4.7.7-NB	Private fuel storage inspections
5.2.2-NB	Targeting clusters of water contamination (Data sharing and assessment by public health officials)
5.3.2-NB	Expansion of the Provincial Groundwater Monitoring Network in the Cataraqui area
5.4.1-NB	On-site sewage system maintenance inspection program within highly vulnerable aquifers and significant groundwater recharge areas