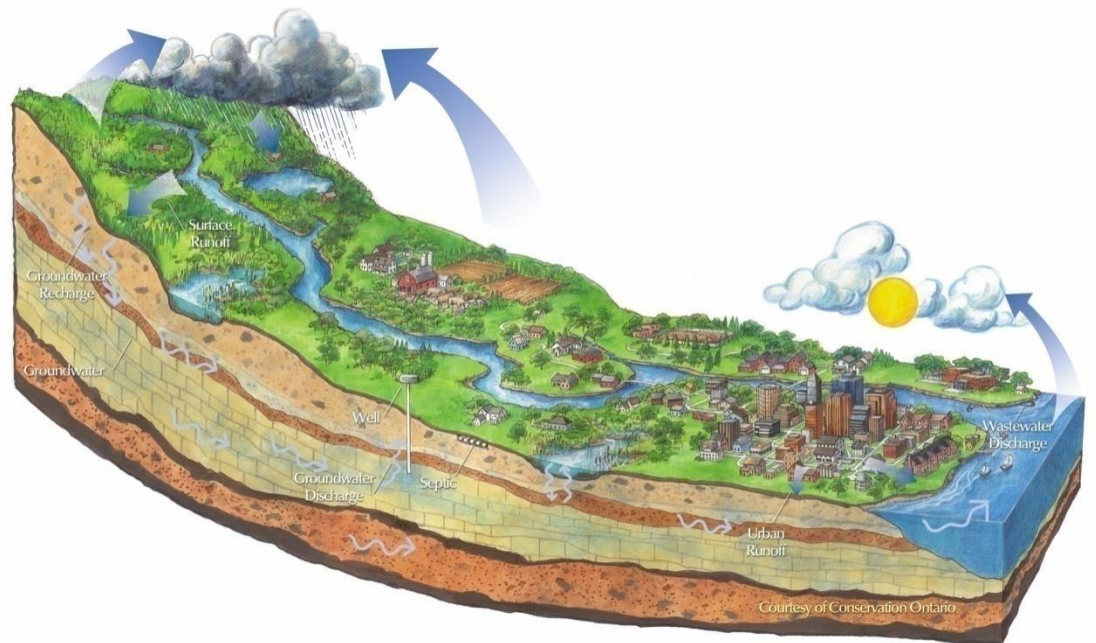


2014

Guidance for the protection and restoration of significant groundwater recharge areas (SGRAs) in the Lake Simcoe watershed



Lake Simcoe Region
conservation authority

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Final Vs 1.1

(This guidance will be revised periodically in order to incorporate updated mapping of the recharge areas)

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1. Background

Recharge areas are the areas of land over which precipitation in the form of rain or snow infiltrates into the ground and flows to an aquifer. Recharge areas tend to be areas that are characterized by permeable soils, such as sand or gravel which allow water to percolate downward and replenish the groundwater system. A recharge area is considered significant when it helps maintain the water level in an aquifer that supplies drinking water, or groundwater to a cold water ecosystem that is dependent on this recharge to maintain its ecological function.

Recognizing the importance of recharge areas to sustaining a healthy watershed, the LSPP includes a number of policies to help identify and protect significant groundwater recharge areas (SGRAs). The approach taken within the LSPP follows three basic steps: (1) define and identify SGRAs; (2) develop guidance for their protection and restoration (this guide), and (3) incorporate policies into municipal official plans to protect, improve and restore (Figure 1).

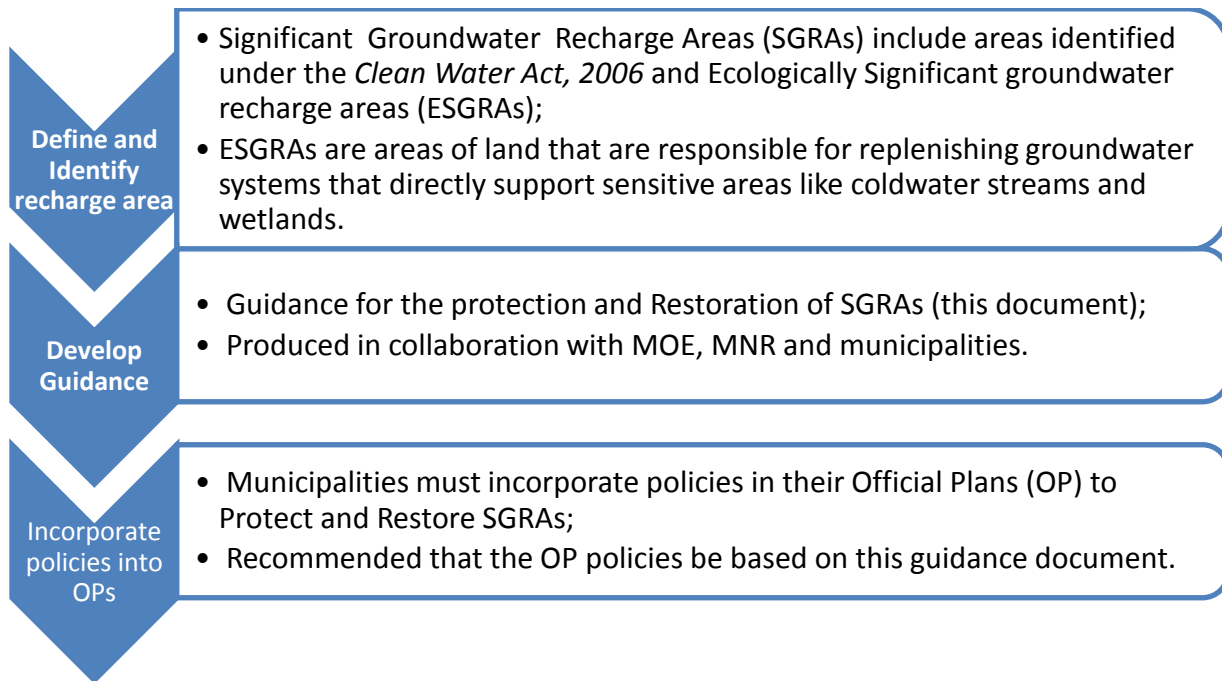


Figure 1: Summary of LSPP approach for the protection of SGRAs.

This guide has been prepared to meet the requirements of LSPP Policy 6.37-SA and has been prepared in collaboration with the Ministry of Natural Resources, Ministry of the Environment and watershed municipalities.

2. What are Lake Simcoe Protection Plan “significant groundwater recharge areas”?

The definitions of significant groundwater recharge areas, in accordance with the LSPP (Policy 6.36-DP) are as follows: (Figure 2)

- a) Significant groundwater recharge areas (SGRAs) identified by any public body for the purpose of implementing the Provincial Policy Statement (PPS);
- b) A significant groundwater recharge area (SGRA) in Source Water Protection Assessment Report required under the *Clean Water Act, 2006 (CWA)*. Following the CWA definition, these are areas within which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer; or
- c) An ecologically significant groundwater recharge area (ESGRA). ESGRAs are areas of land that are responsible for replenishing groundwater systems that directly support sensitive areas like coldwater streams and wetlands.

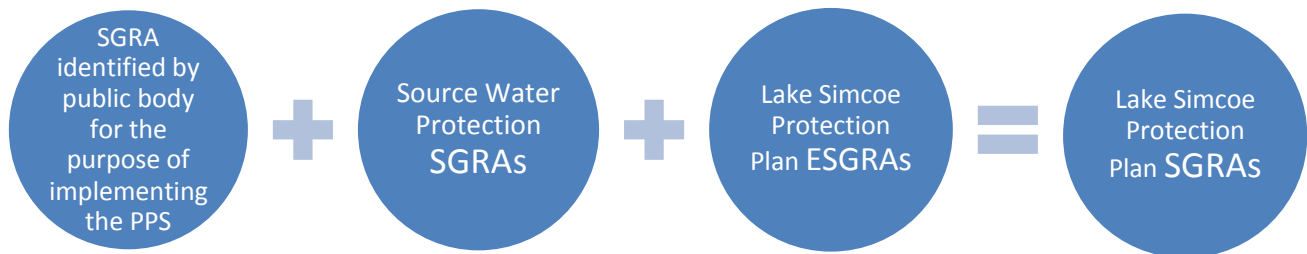


Figure 2: Summary of recharge areas that make up LSPP SGRAs.

2.1 Clean Water Act Significant Groundwater Recharge Areas (SWP SGRAs)

Source Water Protection (SWP) SGRAs have been delineated for the entire Lake Simcoe watershed as required by the *Clean Water Act, 2006* and in accordance with the Technical Rules 44-46, 80-81 (MOE, 2008a).

The Technical Rules (MOE, 2008a) has defined SWP SGRAs within the Lake Simcoe watershed as:

- An area that has an average annual recharge rate that is 15% greater than the average annual recharge rate for the entire Lake Simcoe watershed;
- An area that has a hydrological connection to a surface water body or aquifer that is a source of drinking water for a drinking water system; and

- An area delineated using models considering topography, surficial geology, and how land cover affects groundwater and surface water.

Figure 3 illustrates an area of the landscape that is considered a SGRA in accordance with the Source Water Protection Technical Rules (MOE, 2008a).

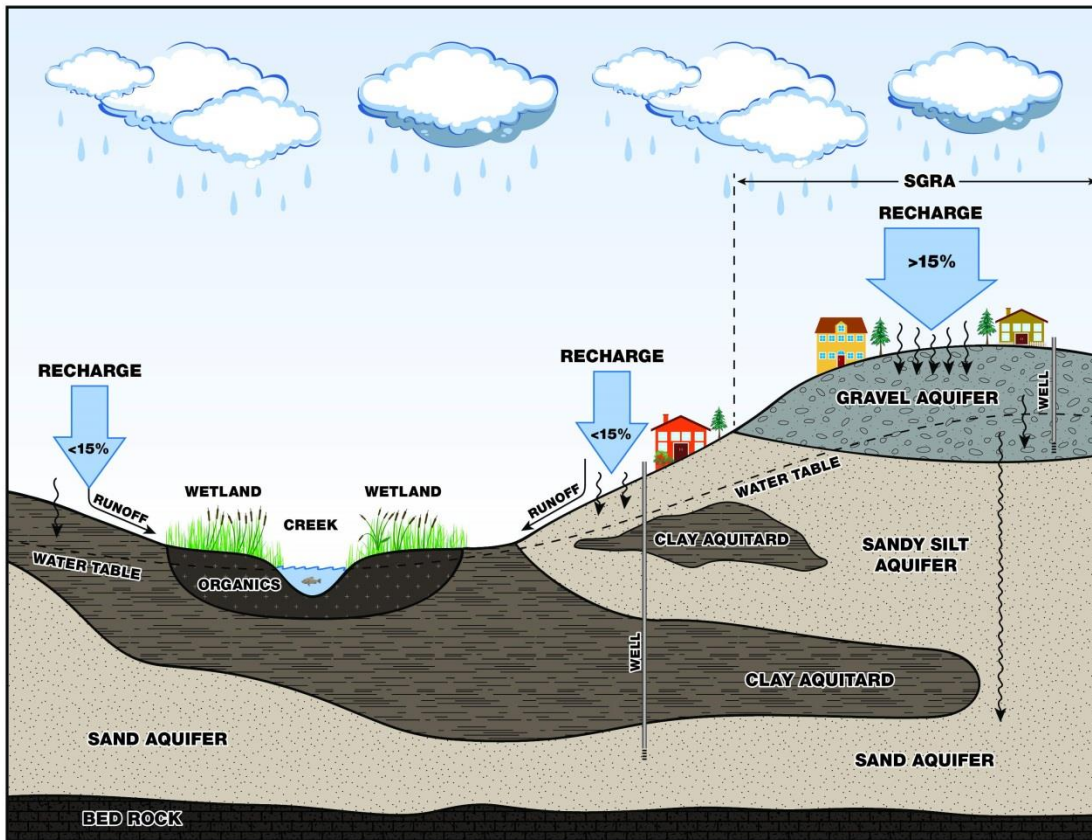


Figure 3: A conceptual diagram that depicts an area of the landscape that is considered a Source Water Protection SGRA in accordance with the Technical Rules. Note that the SWP SGRA occurs where there is both a drinking water well and an annual average recharge rate greater than 15% of the entire Lake Simcoe watershed recharge rate.

The delineation of the SWP SGRAs within the Lake Simcoe watershed were completed using the recharge results from a surface water model that considers variations in topography, surficial soil, land cover and climate, when estimating average annual recharge (Figure 4). The average annual recharge determined for the Lake Simcoe watershed is 164 mm/yr; therefore any area that has an average annual recharge rate of 189 mm/yr is considered a SWP SGRA. Further information on how SWP SGRAs were delineated can be found in the Lake Simcoe and Couchiching-Black River Source Protection Area Assessment Report (Chapter 4; http://www.ourwatershed.ca/documents/assessment_reports/approved_assessment_reports.php).



Figure 4: Source Water Protection SGRAs identified in the Assessment Report. Lake Simcoe and Couchiching-Black River Source Protection Area Assessment Report (Chapter 4).

SWP SGRAs are currently being revised as part of the Tier 3 Water Budget & Water Quantity Risk Assessment studies for the Region of York and City of Barrie water supplies. These revised SGRAs will be included in updates of the Lake Simcoe and Couchiching-Black River Source Protection Area Assessment Report.

2.2 Ecologically Significant Groundwater Recharge Areas (ESGRAs)

ESGRAs are identified as areas of land that are responsible for supporting groundwater systems that sustain sensitive features like coldwater streams and wetlands. To establish the ecological significance of the recharge area, a linkage must be present between the recharge area and the ecologically significant feature (e.g., a reach of a coldwater stream, a wetland, or an area of natural or scientific interest (ANSI)). The identification of an ESGRA is not related to the volume of recharge that may be occurring, rather they represent pathways in which recharge, if it occurred, would reach that feature. While delineating ESGRAs is an important task in establishing the linkage between a recharge area and an ecologically sensitive feature it is not a certainty that ESGRAs will coincide with Source Water Protection SGRAs, as they may not support high volumes of recharge. While ESGRAs and SWP SGRAs are not mutually exclusive, the areas where they do coincide support high volumes of recharge and support ecologically sensitive features. See figure 5 for an illustration of an ESGRA.

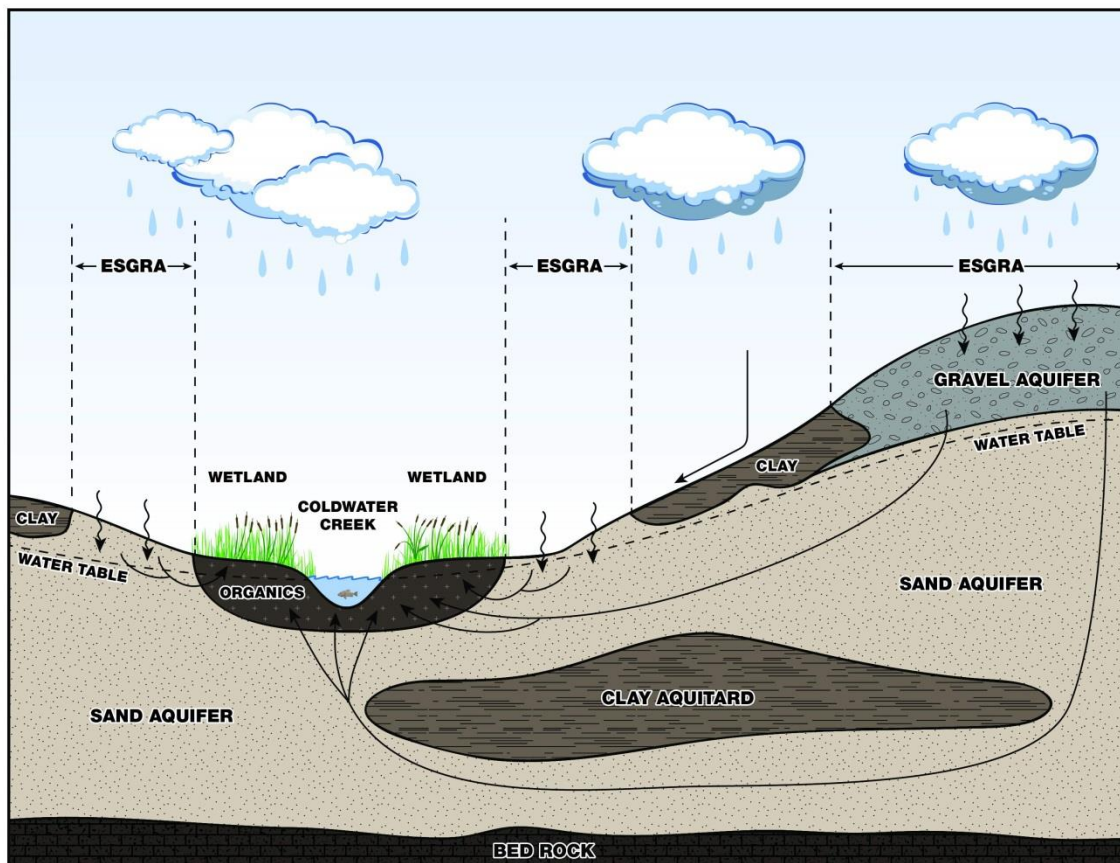


Figure 5: A conceptual diagram illustrating areas of the landscape that are considered to be ESGRAs.

A program for completing ESGRAs is currently underway, with subwatershed plans, to be completed by 2015-16. Appendix A includes a draft schedule for completion of ESGRAs. Figure 6 illustrates areas of the Lake Simcoe watershed for which ESGRAs have been completed.

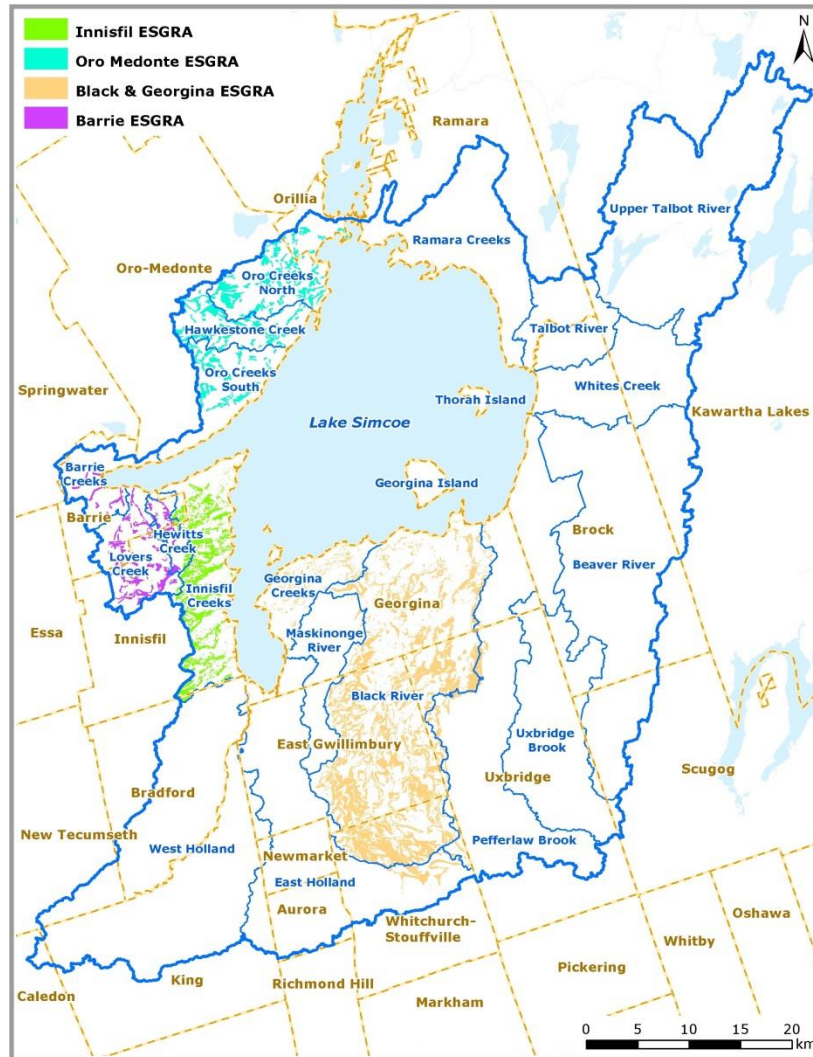


Figure 6: Map illustrating areas of the Lake Simcoe watershed for which ESGRAs have been completed.

2.3 Lake Simcoe Protection Plan Significant Groundwater Recharge Areas

As discussed above, the LSPP defines SGRAs as being a combination of both SWP SGRAs and the newly delineated ESGRAs. The map below (Figure 7) provides the current delineation of the LSPP SGRAs. As ESGRAs for many subwatersheds are still being delineated this map will be updated periodically to reflect the most current information. GIS files of the SGRAs can be obtained from the Lake Simcoe Region Conservation Authority (LSRCA).



Figure 7: Map illustrating LSPS SGRA (i.e. Source Water Protection SGRAs plus LSPS ESGRAs) for those subwatersheds where both recharge areas are available. The map will be updated as studies to identify ESGRAs for remaining subwatersheds are completed.

3. Definitions

Definitions are consistent with those defined within the LSPS's Glossary. For clarity we define recharge areas in accordance with Policy 6.36-DP as:

“Recharge areas” meaning Significant Groundwater Recharge Areas (SGRAs) required under the *Clean Water Act, 2006*, and Ecologically Significant Recharge Areas (ESGRAs) defined under Policy 6.37-SA of the LSPS.

4. Existing LSPP policies

To provide context for the proposed policies in section 5, it is important to understand that the LSPP already contains two policies aimed at protecting SGRAs. These are:

6.39-DP Outside of the Oak Ridges Moraine area, urban settlement area expansions should avoid SGRAs.

6.40-DP Outside of the Oak Ridges Moraine area, an application for major development within a significant groundwater recharge area shall be accompanied by an environmental impact study that demonstrates that the quality and quantity of groundwater in these areas and the function of the recharge areas will be protected, improved or restored.

5. Summary of approach to protect and restore SGRAs

- Avoid developing in SGRAs. Direct development and incompatible land uses away from SGRAs;
- When SGRAs cannot be avoided; ensure pre-development recharge conditions are maintained through the completion of a water balance and hydrogeological study;
- Avoid infiltrating poor quality runoff from paved surfaces such as parking lots and roads without pre-treatment. Promote infiltration from clean water sources, such as rooftop downspouts;
- Promote awareness of the importance of SGRAs – the linkage between surface activities and groundwater quality and quantity;
- Provide financial assistance for projects promoting stormwater management upgrades and infiltration projects within SGRAs; and
- Adopt a multipronged approach to reducing the impact of winter salt application. Approach to consider updates to salt management plans and education and outreach to contractors.

6. Recommendations for the protection and restoration of SGRAs

The following are provided as a guide for the protection and restoration of SGRAs. Where applicable it is anticipated that the recommendation be used as policy text for official plan amendment required under LSPP policy 6.38-DP. See Section 6 for proposed Official Plan content.

#	Tool	Implementer	Existing/ Future	Recommendation
1	Science and research	LSRCA	F	The LSRCA continues to delineate LSPP SGRAs throughout the watershed, and update mapping as the science is improved.
2	Land Use Planning	Municipality	F	Where not already noted in their Official Plans, municipalities should generally direct development and incompatible land uses away from LSPP SGRAs.
3	Land Use Planning	Municipality	E/F	Where avoidance is not possible, municipalities shall only permit new development or redevelopment in LSPP SGRAs, where it can be demonstrated through the submission of a hydrogeological study and water balance, that the existing groundwater recharge will be maintained (i.e. there will be no net reduction in recharge).
4	Land Use Planning	Municipality	F	Municipalities should amend their planning documents to require the treatment of all contaminated runoff, prior to it being infiltrated. The treated runoff must meet the enhanced water quality criteria outlined in the MOE Stormwater Management Guidance Document, 2003, as amended from time to time.
5	By-Law	Municipality	E/F	That municipalities incorporate the requirement for the re-use or diversion of roof top runoff (clean water diversion) from all new development in LSPP SGRAs away from storm sewers and infiltrated to maintain the pre-development water balance (except in locations where a hydrogeological assessment indicates that local water table is too high to support such infiltration) in their municipal engineering standards.
6	Prescribed Instruments	MOE	E	The MOE shall only consider issuing Environmental Compliance Approvals for Stormwater Management Facility retrofits

				within priority subwatersheds that attempt to improve, maintain or restore the pre-development water balance, and meet the enhanced water quality criteria outlined in the MOE Stormwater Management Guidance Document, 2003, as amended from time to time. The MOE reviews existing Storm Water Management works located in ESGRAs for the purposes of implementing the LSPP Policy 4.12-SA.
7	Prescribed Instruments	MOE	F	This document be adopted for the purpose of Policy 6.37-SA of the LSPP. Recommend that the Environmental Compliance Approval Application and Guidance documents be amended to reflect the importance of protecting LSPP SGRAs as a priority consideration in the review of an Environmental Compliance Approval application for stormwater works. Promote conditions requiring infiltration trenches and grassed swales to enhance infiltration in an LSPP SGRA.
8	Education and Outreach	Municipality/LSRCA	E/F	Municipalities in collaboration with the LSRCA shall undertake an education and outreach program to promote internal awareness for municipal and provincial staff and proponents focusing on the importance of SGRAs, and the actions residents and businesses can take to maximize infiltration from impervious surfaces while minimizing contamination such as salt.
9	Stewardship	LSRCA	F	The LSRCA should create eligibility for infiltration projects and stormwater management system retrofits under the Landowner Environmental Assistance Program (LEAP), giving priority to those in SGRAs where possible, as promoted through the LSPP Policy 4.12-SA.
10	Stewardship	Municipality/LSRCA	E	Municipalities shall collaborate with the LSRCA to promote infiltration of clean water in LSPP SGRAs, and prioritize stormwater retrofits utilizing water quality controls, and ultimately infiltration devices for treated stormwater runoff.

11	Incentives	Federal, Provincial Governments	E/F	Federal and Provincial governments should consider extending programs like Lake Simcoe Clean Up Fund and Showcasing Water Innovation that make investments in to stormwater management facility retrofits and infiltration projects within recharge areas.
12	Strategic direction	Municipality/ Commercial Property Managers and Contractors	F	Municipalities should include LSPP SGRAs in their assessment of areas vulnerable to road salt, and modify their municipal Salt Management Plans and snow disposal plans as necessary. Encourage outreach project to educate contractors and large commercial property managers promoting best management practices for maintaining winter roads and parking spaces with an objective of reducing application of road salt and other traction products.

7. Proposed Official Plan content and policies

The following information has been drafted to assist municipalities in amending their Official Plans in accordance with the LSPP policies (6.39 and 6.40) and the recommended policies within section 5 of this guide.

1.0 Objectives

- 1.1 To protect or enhance the quality and quantity of groundwater and surface water and the function of significant groundwater recharge/discharge areas
- 1.2 To ensure that development within the municipality contributes to the protection, maintenance and enhancement of water and related resources and aquatic ecosystems on an integrated watershed management basis
- 1.3 To ensure that development promotes water conservation and supports the efficient use of water resources on a watershed basis
- 1.4 To protect municipal drinking water from contamination

2.0 Definition

2.1 Significant Groundwater Recharge Areas (SGRA) including Ecologically Significant Groundwater Recharge Areas (ESGRA) have been defined under 6.36-DP of the Lake Simcoe Protection Plan as those areas identified:

- 2.1.1 By a public body for the purposes of implementing the Provincial Policy Statement
- 2.1.2 Through the Assessment Report prepared under the *Clean Water Act, 2006*
- 2.1.3 By the guidelines prepared under 6.37-SA of the LSPP

2.2 Significant Groundwater Recharge Areas (including ESGRAs) have been shown on Schedule G – “Water Resources” of this Official Plan based on the information and mapping provided by the LSRCA. For greater certainty regarding the location of a SGRA, the LSRCA should be consulted for comment.

3.0 Policies

3.1 Urban settlement area expansions should avoid SGRAs. Settlement area expansions shall only be permitted within SGRA when all other alternative areas for expansion have been fully explored.

3.2 Development and incompatible land uses shall be generally directed away from SGRAs as shown on Schedule “G”. The uses identified within the land use designations as shown on Schedule “A” to this Plan may be permitted within a SGRA subject to Policy 3.3 and the requirement for a Hydrogeologic Evaluation. Any application to amend this Plan or the implementing Zoning By-Law or any application to subdivide by consent or plan of subdivision must satisfy Policies 3.1, 3.2 and 3.3 prior to any approval.

3.3 An application for major development within a SGRA and their minimum area of influence shall be accompanied by a Hydrogeologic Evaluation. This Evaluation shall be prepared by a qualified professional to the satisfaction of the municipality and local conservation authority prior to any planning approvals or the issuance of permits under the Ontario Building Code Act or Regulations passed through the Conservation Authorities Act. For the purposes of this policy, major development is defined as a proposal with a proposed impervious area greater than 500 square metres.

3.4 In general, the Hydrogeologic Evaluation must demonstrate that the quality and quantity of groundwater in the area and the function of the recharge area will be protected, improved, or restored. The Evaluation must also demonstrate that there will be no negative impacts on the associated aquatic features that depend on the SGRA including wetlands, watercourses, seeps and springs, and fish habitat. In particular, the Hydrogeologic Evaluation shall:

- 3.4.1 Define the recharge/discharge conditions and area of influence
- 3.4.2 Identify groundwater/surface water interactions
- 3.4.3 Characterize the sensitivity to contamination
- 3.4.4 Provide a pre-to-post water balance analysis
- 3.4.5 Evaluate and recommend appropriate mitigation requirements

3.5 Further to Policy 3.4 and prior to the preparation of any Hydrogeologic Evaluation, the qualified professional shall consult with the municipality and conservation authority in order to establish the proper terms of reference for the study. Based on the magnitude, scale, and nature of the proposed development, the municipality in consultation with the conservation authority may scope the Evaluation.

Appendix A:

Proposed Schedule for completion of ESGRAs

Subwatershed	Expected completion date
Black River & Georgina Creeks	Completed
Innisfil Creeks	Completed
Barrie Creeks	Completed
Hewitts Creek & Lovers Creeks	Completed
Oro Creeks North, Oro Creeks South, & Hawkstone	Completed
Ramara Creek, Whites Creek & Talbot River	Mid 2014
East Holland River, West Holland River, & Maskinonge River	2014/15
Beaver River & Uxbridge Brook	2015/16