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Watershed-based Source Water Protection is a significant undertaking within the Province of Ontario. Sound data will be key to the success of this initiative. Using five pilot subwatersheds within the participating Conservation Authorities, this pilot project identifies data needs for source water protection planning in rural Ontario.

## An Assessment of Data Requirements and Availability for Source Water Protection



In December 2001, the Ministry of the Environment, Ministry of Natural Resources and Conservation Ontario formed a partnership to develop a series of watershed-based pilot projects. Phase I, completed in 2003, included six pilot projects that focused on new and innovative approaches to watershed stewardship. Phase II, with the objective to develop, implement and demonstrate place-based environmental management approaches, will provide some of the building blocks for the anticipated watershed-based drinking water source protection that will be undertaken in Ontario.

This is one of four pilot projects completed during Phase II seeking on the ground results, focusing on implementation, and the technical issues faced by practitioners when implementing drinking water source protection.

The full reports and fact sheets are available on Conservation Ontario's website.

## The Project at a Glance...

This report was prepared under the leadership of the Lower Trent, Ganaraska, and Crowe Valley Conservation Authorities to assess the availability of data for source water protection in rural Ontario. Research was conducted in five pilot watersheds, with the assistance of water resources experts from across the province, to identify, compare and assess the suitability of data sets available to meet planning requirements. The report provides background information that will help planning teams identify and locate suitable data required for source water protection as well as to recognize data gaps and management issues.

Source water protection is a major undertaking, which calls for significant commitment and investment by the provincial government and its partners. The report identifies where new data sets need to be created and existing data sets updated and expanded. It also suggests the development of data standards and a mechanism to ensure data is both accessible and current. Finally, the report acknowledges the need for collaboration by practitioners to address data management issues.

## What is Source Water Protection?

Watershed-based source water protection was a key recommendation of the Walkerton Inquiry in 2002. Source water protection is part of the multi-barrier approach required to protect Ontario's drinking water, from source to tap. Protecting surface water and groundwater from becoming contaminated or overused is an essential element of source water protection.

A Source Water Protection Plan represents an agreement among the people and municipalities of a watershed about the ways to protect water quality and quantity. The provincial government has recognized source water protection as a critical first step in ensuring that Ontarians have safe, clean drinking water now and for the future.

## Unique Rural Challenges in Source Water Protection

- Almost two million Ontarians draw their drinking water directly from either groundwater or surface water sources. With a large percentage of rural residents drawing their water from private wells or directly from lakes and rivers, source water protection is the only barrier against contamination.
- There is a lack of data available on water quality, stream flow, groundwater quality and quantity, and land cover in many rural areas.
- Northern Ontario has unique issues related to sparse population and resource-based industry.



# Required Data for Source Water Protection Models and Mapping

This project focused on determining the availability of data for source water protection mapping and modeling in rural Ontario. A list of maps and type of data required for source water protection (mapping and modeling) was developed based on a review of the Walkerton Inquiry reports, provincial expert committee recommendations, the Province's White Paper on Watershed-based Source Protection Planning, and the proposed *Drinking Water Source Protection Act* (June 23, 2004). A data and metadata search was conducted to identify what data sets were available to meet the requirements and data sheets were prepared for each data type. Comparisons were made according to selected data themes including:

- watershed boundaries
- wetlands
- woodlands
- agricultural lands

A polygon count of the various data sets, where applicable, was also done to provide a comparison of the data. A visual review of the various data sets was also done and conclusions drawn on the best data sets available for each data theme.

Since there is no valid "true" data set, the analysis demonstrates the relative agreement of one data set with another, rather than which is most accurate. However, areas of discrepancy are highlighted and are examined in more detail to see which data set appears to be more accurate.

Finally, the project developed a list of maps to assess the data based on key requirements for source water protection (such as natural features and existing land use). Once the maps were created, a visual analysis of the maps for the various pilot watersheds was completed to assess the availability and completeness of data.

## Top 10 Data Sets

The study identified a number of data deficiencies and data-related issues. While cost savings would be realized if these issues were addressed at the provincial level, source water protection planners should be aware that they may need to be addressed locally. Resources and efforts need to focus in particular on the following top 10 data sets:

- land cover/land use
- surface water quality and groundwater monitoring
- stream flow monitoring
- Water Well Information System (WWIS)
- identification of abandoned water wells
- contaminated site inventory
- potential contaminant sources
- Permits To Take Water (PTTW)
- parcel fabric
- tile/municipal drain mapping

## Additional Data Issues

In addition to specific data sets and databases, other issues relating to data have been identified as part of this project. Additional data management issues include:

- Data exchange framework model for all stakeholders
- Consideration of new data compilation and management early in the process
- Accessibility of data sets
- Benefits of implementing common data models
- Computer/software requirements
- Scale of data and projections
- Data suitability for the intended purpose (e.g. mapping versus modeling)
- Northern Ontario issue



## Moving Forward

Source water protection is a critical element of water resource management. This pilot project has identified key issues related to data requirements and management systems that need to be addressed. The data sets that were developed will be a useful starting point for Conservation Authorities and others as they prepare Source Water Protection Plans. The Province has recognized that significant funding will be required to tackle these issues and move toward a comprehensive, accessible data management system.

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