

EXECUTIVE SUMMARY

Based on the recommendations from Justice O'Connor's inquiry into the 2000 Walkerton drinking water crisis, the Clean Water Act, 2006 was passed by the Provincial Government to protect water sources for drinking water systems. While local water treatment plants provide an abundance of clean, reliable, and safe drinking water, protecting 'source water' is the first step in a multi-barrier approach to ensure the quality and sustainability of our municipal drinking water supply. The Act provides a framework for the development and implementation of watershed-based Source Protection Plans.

In accordance with Provincial Regulations under the Clean Water Act, the source protection planning process is being directed by a multi-stakeholder 'Source Protection Committee', with input from a Municipal Working group and in consultation with various stakeholders. In the Essex Region Source Protection Area, the development of the Assessment Report(s) and Source Protection Plan is supported by staff of the Essex Region Source Protection Authority (Essex Region Conservation Authority) assisted by various specialized Consultants. Similar work is being carried out in Conservation Authorities through-out Ontario, as required by, and funded by, the Ministry of the Environment (MOE).

This Draft Proposed Assessment Report has been developed in accordance with the requirements of the Clean Water Act and the MOE's 'Directors Rules'. Through information from various technical studies, this science-based Assessment Report:

- Identifies and evaluates 'vulnerable areas' (Intake Protection Zones) associated with municipal drinking water intakes, and Highly Vulnerable Aquifers.
- Identifies the types of existing or potential future land use activities in each of the vulnerable areas, that could be 'threats' to source water quality
- Evaluates water quality 'issues' based on the quality of source water at each water intake for municipal drinking water systems.
- Evaluates water *quantity* conditions ('water budget') for inland watersheds and groundwater systems, in relation to various water demands or uses.

Watershed Characterization

The Essex Region watershed is approximately 1,680 square kilometres in size and predominately consists of a relatively flat clay plain with the exception of some sandy areas, primarily in the southern portion of the region. The predominant land use in the region is agriculture, due to the region's excellent farmland and growing conditions. There are also several urban areas, the largest being the City of Windsor.

The Essex Region consists of three major watershed areas consisting of the areas draining to Lake St. Clair, the Detroit River, and Lake Erie. These major drainage areas may further be divided into 20 or more sub-watersheds. The region also includes Pelee Island and several other islands. The waters of Lake St. Clair and the western basin of Lake Erie are among the shallowest in the Great Lakes System. Based on the available data and information generated, the water quality of most streams and near shores in the Region is generally poor, particularly in terms of nutrients, turbidity, and E.coli.

Municipal drinking water supplies in the Essex Region are all drawn from the Great Lakes system (Detroit River, Lake Erie and Lake St. Clair). There are seven (7) municipal water treatment plants (WTPs) in the region and an additional plant in Wheatley which serves part of the Municipality of Leamington in the Essex Region. Approximately 95% of the Region's population is served by municipal water treatment plants. The remaining 5% of the population depend on groundwater or other sources of drinking water. In the Essex Region, There are no municipal drinking water systems which use wells or inland streams as source waters.

Water *Quantity* Risk Assessment

A Conceptual Water Budget and a Tier 1 Water Budget have been completed for the Essex Region. These studies, as described in Section 3 of the Assessment Report, involved an analysis of data obtained from various sources on climate, stream flow, water demand, and groundwater systems stations to estimate the water budget components and stress conditions for surface water and groundwater. Water budget and water use demand estimates were used to determine the water quantity stress levels in different sub-watersheds at various times during the year. Based on the available data and information

generated, most watersheds in the Essex Region were categorized as significantly or moderately stressed in terms of surface water quantity conditions. Water demand, or use, is generally not felt to be a significant factor in producing a stressed condition on surface water. The greatest factors in terms of surface water stresses are historical clearing and drainage, which greatly reduce water retention.

From the groundwater point of view, the watersheds were categorized as having low stress groundwater quantity conditions. This does not necessarily indicate groundwater resources are sufficient and sustainable, as further study in this area is recommended in this regard, particularly in relation to potential increased demand for water use in the future, and climate change considerations.

Further detailed Water Budget studies cannot be carried out through the Source Water Protection program at this time, as the municipal drinking water systems do not rely on inland water sources.

Water Quality Risk Assessment

Based on the requirements of the Ministry of the Environment, ***Vulnerable Areas*** in the Essex Region were identified and evaluated as part of a ‘water quality risk assessment’. In these areas, special care may need to be taken in the use and handling of chemicals and other potential contaminants. ‘Vulnerable areas’ addressed include *Intake Protection Zones (IPZs)* and *Highly Vulnerable Aquifers (HVAs)*. *Wellhead Protection Areas* are another category to be considered; however, they are *not applicable* in the Essex Region, as no municipal drinking water systems are supplied by groundwater.

Intake Protection Zones are areas of land and water, where run-off from streams or drainage systems, in conjunction with currents in lakes and rivers, could directly impact on the source water at the municipal drinking water intakes. The area very close to the intake is called Intake Protection Zone One (IPZ-1). This area is typically a one-kilometre radius in the water around an intake, plus an inland setback along the shore. Outside this area is the Intake Protection Zone Two (IPZ-2). This area accounts for the influence of nearby watersheds, where runoff may pick up pollutants and affect water quality in the near-shore waters at municipal intakes. The IPZ-2s, generally

encompassing areas within a few kilometres of the intakes, are based on a ‘two-hour time of travel’, for the flow of water along the shores and in the tributary watersheds.

Future update(s) of the Assessment Report will address a third category of an Intake Protection Zone (IPZ-3), involving more extensive watershed areas which may affect the quality of water at the intakes during a more extreme rainfall or wind storm.

The municipal drinking water intakes are also assigned a ***Vulnerability Score*** ranging from 1 to 10, with 10 being the most vulnerable. A variety of factors come into play when calculating the vulnerability of an area, such as: intensity of land use; the depth of the water at the intake; and water quality issues. Vulnerability scores are higher for intakes in the Detroit River (ranging from 7.2 to 9.0) largely due to the urban land use. The scores tend to be more moderate for intakes in Lake St. Clair (6.3 to 9.0), and lower for intakes in Lake Erie (4.2 to 7.0), as the intakes are in somewhat deeper water.

Identifying potential ***Threats*** to source water, as required by the Ministry of the Environment, is an important aspect of source water protection. A ***threat*** is an existing or potential future land use activity that has the potential to affect the quality of water used as a source of drinking water. Threats may be scored as Significant, Moderate or Low, based on the Ministry of the Environment’s Tables of Drinking Water Threats. The Tables of Drinking Water Threats can be accessed using the following link:

<http://www.ene.gov.on.ca/en/water/cleanwater/cwadocs/TablesOfDrinkingWaterThreats.pdf>

The Ministry of the Environment requires that ‘existing significant threats’ be identified in the Assessment Report. In the Essex Region ***unconfirmed existing significant threats*** were identified in the Windsor IPZ-1 and IPZ-2, involving 45 sites, and 3 sites in the Amherstburg IPZ-1 (typically involving activities such as industries/businesses and municipal discharges). Significant threats are not considered possible at this time in most other IPZs through this ‘scoring approach’, as the Vulnerability Scores must be higher than eight(8) in order to generate a ‘significant risk score’. Other approaches as specified in the ‘Directors Rules’ may be used to evaluate potential significant threats in the updated Assessment Report(s).

Highly Vulnerable Aquifers (HVAs), generally located in the sandy soil areas in the southern part of the Essex Region, and including most of Pelee Island, are identified and evaluated in the Assessment Report. Based on the maximum vulnerability score of six (6) that HVAs can be assigned, activities in HVAs can only be scored as Moderate or Low drinking water threats through the ‘scoring approach’ at this time.

Issues are identified in the Assessment Report based on a comprehensive evaluation of the quality of source water at each water intake. As *issues* are likely to continue if nothing is done to address the activities that cause them, the Clean Water Act requires that they be addressed in the Source Protection Plan, if they are determined to be from anthropogenic sources within a given Source Protection Area. The identified source water issues for most of the intakes in the ERSPA include organic nitrogen, turbidity, and aluminum. E-coli is identified as an issue with the source water for the Amherstburg intake. Further investigation is needed as to the extent to which the identified *issues* result from anthropogenic sources, and the activities and areas that are contributing to these issues. Algal blooms and related concerns regarding cyanotoxins, while not identified as *issues* at this time, will also be further studied.

Conditions are areas or sites where there is an existing contamination as a result of past activities. Various environmental reports, studies, and other literature were reviewed to identify if any such conditions exist in the ERSPA. No conditions have been identified through the work to date. The updated Assessment Report(s) in the future may include any new information on *conditions*.

Great Lakes Considerations

The Essex Region Watershed flows into the Great Lakes system and the run-off waters from the Region’s watersheds are known to affect the near-shore water quality in the Great Lakes system. As required by the Clean Water Act, information associated with the following were considered in the preparation of the Assessment Report, as outlined in Section 5:

- Great Lakes Water Quality Agreement (GLWQA)

- Detroit River Canadian Clean-up (DRCC), Lake Erie Lake-wide Management Plan (LaMP), and Wheatley Harbour Area of Concern (AOC)
- Canada Ontario Agreement (COA)
- Great Lakes Charter (GLC)

State of Climate Change Research in the Great Lakes Basin

A general overview of climate change considerations is included in Section 6, along with some preliminary comment regarding implications for the Assessment Report. Global temperatures have been rising steadily across the planet in recent decades. The international and national scientific communities expect this trend to continue and predict more extreme weather events in the future. Subject to further study, *climate changes such as more intense storms may affect water quality, and possibly exacerbate source water quality 'issues' for the various water treatment plants in the Region. If there are more frequent periods of lower water levels in the Great Lakes in the future, this may increase the vulnerability of some water intakes* and may alter the 'scoring' of potential 'threats' to source water quality. Increased drought conditions and evapotranspiration rates may result in increased water quantity stress levels of surface streams and/or groundwater systems, although likely not affecting municipal water supplies.

Future Work Plan for the Next Assessment Report(s)

The findings of this Assessment Report are based on the best available information and on the extent to which studies could be completed with-in the required timelines. Further studies and new information that informs the findings of this Assessment Report will become available in the future. Some examples of the future work planned in the next two years for the updated Assessment Report as required by the Ministry of the Environment includes:

- A third category of an Intake Protection Zones Three (IPZ-3s) involving more extensive watershed areas which may affect the quality of water at the intakes during a more extreme rainfall or wind storm.

- Further evaluation/confirmation of *Existing Significant Drinking Water Threats* that must be addressed in the Source Protection Plan.
- Evaluation of the extent to which the *Issues* which have been identified are due to anthropogenic sources, and the areas and activities that may be contributing to such *Issues*. These contributing activities are considered to be *significant threats* and therefore must be addressed through Source Protection Plan Policies.

Consultation

The Essex Region Source Protection Committee recognizes the importance of early public consultation beyond the required formal consultation, under the Clean Water Act general regulation 287/07. In the Fall of 2009, Public Meetings were scheduled for each intake protection zone area across the region to allow for multiple opportunities for stakeholders to be involved in the consultation process and aligned with the availability of technical reports.

The required consultation includes a public meeting and posting of the Assessment Report for comment. Two posting periods are required: one posted by the Source Protection Committee for consultation on the Draft Assessment Report and a subsequent posting by the Source Protection Authority for comments on the Proposed Assessment Report.

The Draft Proposed Assessment Report was published on the internet for a 35-day comment period, along with a copy made available for review at the Essex Region Conservation Authority office. The notice of the public meetings and posting of the Draft Proposed Assessment Report was published in newspapers and distributed to Municipal Clerks and stakeholders.

The public meetings were held on Wednesday March 3 and Thursday March 4, 2010. Comments were accepted on the Draft Proposed Assessment Report until March 15, 2010. No comments direct at the Assessment Report were received during the first consultation period and no substantial changes have been made to the report.

The Proposed Assessment Report was published on the internet for a 30-day comment period from March 27, 2010 until April 26, 2010. A copy for review was available at the Essex Region Conservation Authority office. The Proposed Assessment Report notice was published in the newspaper on March 27, 2010 and copies distributed to municipal clerks and others.

This consultation provided municipalities, affected landowners, stakeholders, and the public with information on technical studies as part of this Assessment Report.

Appendix XII provides a chronological summary of the consultation on the Assessment Report and includes copies of the Notices, advertisements, and letters to municipalities and other stakeholders.

Source Protection Planning Process

The Assessment Report will be used as a basis for the development of locally-developed Source Protection Plans that set out policies to reduce the risks to protect sources of drinking water. The Plan is intended to be completed by 2012 and will set out:

- How the risks posed by drinking water threats will be reduced or eliminated;
- Policies regarding actions to address and monitor threats and issues
- Who is responsible for taking action; and timelines
- How progress will be measured and reported.

The development of the Source Protection Plan will be directed by the Source Protection Committee, through support provided by the Source Protection Authority, in accordance with the Clean water Act and associated Regulations. The process will involve continued collaboration with municipalities, and extensive consultation with property and business owners, industry, agriculture, community groups, and others. The Source Protection Plan may involve a range of voluntary or regulatory programs and tools including outreach and education; incentive programs; land use planning related policies; or new or amended 'provincial instruments'. In the case of some significant threats, special measures may be specified such as 'risk management plans' or 'land use restrictions'. In extreme cases,

prohibition of certain land uses may be considered as a last resort. Actions to substantially reduce the risk posed by existing or potential future activities determined to be ‘significant threats’ will be mandatory, as required by the Clean Water Act.