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STRATEGY FOR PROTECTING DRINKING WATER SOURCES

The Transportation and Works Committee recommends the following:

- 1. Receipt of the presentation by Wendy Kemp, Program Manager, Environmental Services; and**
- 2. Adoption of the recommendations contained in the following report dated January 21, 2009, from the Commissioner of Environmental Services.**

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council endorse the Wellhead Protection Areas for all York Region wells and Intake Protection Zones for Lake Simcoe intakes (appended as Figures 1 through 3 to this report) for the sole purpose of activating the Ontario Drinking Water Stewardship Program.
2. Regional Clerk forward this report to the Clerks of the local municipalities for information and to the Chairman of the South Georgian Bay Lake Simcoe and Credit Valley, Toronto Region, Central Lake Ontario (CTC) Source Protection Committees.

2. PURPOSE

This report updates Regional Council on proactive actions taken to manage our groundwater resources beyond the compliance requirements to ensure they remain available and safe to drink for future generations. It also seeks approval of the Wellhead Protection Areas and Intake Protection Areas for the sole purpose of the Ontario Drinking Water Stewardship program.

3. BACKGROUND

Groundwater remains a vital source of drinking water in York Region

Drinking water within York Region is currently supplied by groundwater, surface water from Lake Simcoe or from Lake Ontario or a combination of lake and groundwater based systems. York Region currently has 37 active groundwater wells to provide drinking water to over 200,000 residents, with plans to connect three new wells to existing systems in the near future for the communities of Mount Albert, Schomberg and Nobleton (*see*

Attachment 1). Groundwater will continue to be a long-term critical source of drinking water for these communities. Groundwater also remains vital to thousands of York Region residents located in rural areas who maintain their own private wells.

York Region has formed strong partnerships to integrate stakeholder interests across the watershed

Groundwater, by its nature, flows beyond York Region boundaries and crosses many municipal and jurisdictional boundaries. In early 2001, York Region joined a partnership with the Region of Durham, Peel Region and the City of Toronto along with nine Conservation Authorities called York-Peel-Durham-Toronto Conservation Authorities Moraine Coalition (YPDT - CAMC). This partnership has been instrumental in developing an extensive data warehouse to store and share for water related information across the partnering agencies, laying the foundation for the Regional groundwater flow model.

York Region has a thorough understanding of groundwater flow and maintains an active role in advancing local groundwater research

Over the past 50 years, extensive research and studies have significantly advanced our understanding on how groundwater moves from the top of the Oak Ridges Moraine to rivers and lakes. In recent years, extensive work was undertaken to match this understanding with computer models to assess the cumulative impacts of water taking. Building from a substantial data warehouse that holds millions of detailed records on geology, climate, stream flow and other significant ecological information, this computer model helps to identify key areas for monitoring and protection. Knowing where the water originates, how it travels underground and how long it takes to get to a well or stream are critical questions that are more readily answered using a computer model. For example, it is known that rainfall sinks into the ground more quickly at the top of the Oak Ridges Moraine than on the toe of the slope. This information supports the need for protective land use policies thorough identification of these vulnerable areas. This extensive model, called the YPDT-CAMC model, provides water managers across the Oak Ridges Moraine with tools to better understand and protect this vital water resource for many residents and hundreds of headwater streams.

York Region has a proactive management plan that goes well beyond legislative requirements

In recent years the Province of Ontario has made safe drinking water a priority by implementing several pieces of legislation to ensure delivery of safe drinking water. Using a comprehensive ‘from source to tap’ approach; these legislative pieces prescribe multiple barriers for protection of public health. Relevant legislation includes:

- *Clean Water Act 2006* which aims to protect the source of municipal drinking water.

- *Safe Drinking Water Act 2002* which controls the operation, testing and regulation of drinking water systems.
- *Ontario Water Resources Act, 1990* which regulates the quantity of water takings.
- *Oak Ridges Moraine Conservation Act 2001* which protects this vital landform and essential source of groundwater for numerous municipal systems, private wells and thousands of streams.
- *Proposed Lake Simcoe Act (Bill 99)* which seeks to protect and restore the ecological health of Lake Simcoe Watershed.

York Region has charted a course to keep in step with new Provincial directions on water management and staff continue to take a proactive approach to protect our drinking water resources. This report provides summary of our ongoing activities that circumvent risks, with particular emphasis on protecting groundwater.

4. ANALYSIS AND OPTIONS

There are three strategic themes to managing groundwater in York Region:

Reliable groundwater supply that meets community needs without impairment to the natural environment is key

To meet drinking water needs, extensive groundwater monitoring is undertaken to ensure there is sufficient quantity and quality of water, and to maintain well performance to ensure sustainable water use. Beyond the initial Environmental Assessment studies for production well sites, continuous monitoring and assessment is carried out to evaluate the influence of pumping groundwater on local groundwater and surface water resources and on other nearby groundwater takers. This monitoring program consists of over 120 wells and 10 rainfall gauges equipped with continuous data logging devices located in strategic locations across the Region. This network provides real time data to support decisions related to aquifer management, private well complaints, new development and Permit to Take Water applications. Water levels also provide insight to well performance, to ensure optimal water use across the well field. Working together with our local Conservation Authorities, who collect the stream and ecological data, groundwater flow predictions can be validated to further enhance existing knowledge.

Source water must be protected by limiting land use activities that threaten drinking water sources

Source water protection is not a new approach in York Region. Production wells constructed as early as 1960s and still in use today, were designed to draw groundwater from deep sources. The deep aquifer, which is at least 100m (300ft) below the surface, is naturally protected from surface activities by overlying thick till sediments which hampers the downward movement of water. Recent water testing from one deep well in

Aurora suggests the groundwater may be over 4,500 years old. As a result, York Region groundwater typically requires minimal treatment and shows minimal variation in water quality over time, compared to most surface water systems. However, there remains concern after the Walkerton Tragedy that municipalities should take a more precautionary approach in protecting their drinking water supplies.

Prior to the introduction of the *Clean Water Act 2006*, York Region had already delineated wellhead protection areas using the groundwater flow model to support requirements under the *Oak Ridges Moraine Conservation Act 2001*. In addition, extensive work had been completed to meet water budgets needs also required under this legislation. As part of the conformity exercise for the Oak Ridges Moraine Conservation Plan, York Region and the area municipalities have all adopted wellhead protection area mapping and land use policies in their Official Plans for the Oak Ridges Moraine which limit new uses that may impair the aquifer. The Greenbelt Plan 2005, which impacts all municipalities in the Region, also requires that wellhead protection areas be delineated as part of Regional and local conformity exercises.

The Region is currently updating its Regional Official Plan. This work, scheduled for completion in 2009, will bring the Regional Plan into conformity with the Greenbelt Plan. Wellhead protection area mapping and policies will be included for municipal wells off-Moraine throughout York Region and for new wells on the Oak Ridges Moraine. The policy context for the off-Moraine wellhead protection areas will be based on the policies for the Moraine as an interim basis until the Source Protection Plans area completed in 2012. Regional Plan policies will further require that local official plans and zoning bylaws restrict or prohibit incompatible use in wellhead areas.

A report to Planning and Economic Development Committee is anticipated at the March 2009 meeting laying out the expected policy framework and mapping for wellhead protection areas as part of the Regional Official Plan update. Staff of the Environmental Services Department is working closely with Regional Planning staff in preparing the March report and the updated Regional Official Plan and will be available to assist areas municipalities in the preparation and implementation of appropriate wellhead protection area strategies.

In 2006, the *Clean Water Act* introduced additional tools, requiring extensive technical work to further delineate and protect the source of drinking water for municipalities using a semi quantitative risk assessment. York Region is undertaking this technical work related to its groundwater wells, which will form part of an overall Assessment Report. Following the Assessment Report, a Source Protection Plan will be developed to outline land use policies and actions for mitigating significant risks to source waters. The Plan is anticipated to be completed by 2012.

In the meantime, York Region is a member on the Source Protection Committees for the South Georgian Bay Lake Simcoe Region and the Credit Valley Toronto Central Lake Region. These Committees provide overall direction and authority for full

implementation of Source Protection Plans. In addition, York Region reviews and comments on new planning applications, redevelopment of contaminated lands and new external Permit to Take Water applications, with a particular focus on activities located in Wellhead Protection Areas for all municipal wells. Opportunities to introduce innovative water reuse of dewatering discharge and water efficient technologies are recommended where possible.

Continuous advancement in science through education, partnership and collaboration is critical

To avoid duplication of efforts and ensure the effective use of resources, York Region partners with agencies and research foundations to advance watershed initiatives. Annually, York Region funds local Conservation Authorities and reviews their program details to ensure alignment with Regional needs. We have recently initiated work with two Universities, namely the University of Waterloo, to assess groundwater age, and with the University of Toronto, to better estimate when to replace critical surface water treatment equipment based on real time water quality monitoring. These partnerships create a network of information that is collaboratively shared across multiple agencies. Our work with these two agencies further validates and enhances our groundwater model predictions.

The Ontario Drinking Water Stewardship Program funds actions to protect municipal drinking water sources

On August 11, 2008, the Province introduced a new funding program open to persons or groups, including municipalities to undertake immediate actions to protect municipal drinking water through stewardship activities. The Province is willing to fund actions in the following categories:

- Well upgrades and well decommissioning.
- Septic system upgrades and repairs.
- Runoff and erosion measures.
- Pollution prevention reviews for small and medium sized businesses.
- Land conservation measure (available to municipalities for land purchase, easements and leasing).
- Fuel storage management practices.
- Agriculture activities including manure storage, handling and treatment.

Endorsement of Wellhead and Intake Protection Zones is required to activate funding from the Ontario Drinking Water Stewardship Program

Funding under this program is currently limited to areas within the two year time of travel of a wellhead protection area and the intake protection zone 1 (IPZ1) for surface water systems (*Attachments 2 and 3*). The two-year time of travel and intake protection zones for surface water systems require the highest level of protection since they

represent the quickest pathway for pollution to travel to a well or intake. Lake Simcoe waters are drawn from pipes, called intakes, located off shore in deep waters. Intake Protection Zone represents the area around the opening where water enters the drinking water system. Like groundwater, surface water also requires protection from pollution within designated areas. Actions taken to address threats in these areas will reduce the likelihood of harm to the drinking water source.

To activate the flow of funds, the Province requires Regional Council to endorse these areas if not already included in municipal official plan. Currently, only those wellheads located on the Oak Ridges Moraine are approved in the Official Plan. From time to time, these wellhead protection zones may change slightly as the underlying model assumptions change with new geological data or increased pumping rates. However, York Region has undertaken a conservative approach to reduce the likelihood of significant changes to these areas.

York Region is working jointly with local municipalities, Lake Simcoe and Toronto Region Conservation Authorities to develop stewardship programs that will dovetail with existing programs and provide enhancements. It is anticipated that York Region will submit an application for funding under this new Program. For example, a major septic decommissioning program is anticipated in Nobleton, offering considerable reimbursement for residents located in the two year time of travel wellhead protection area. It also anticipated that extensive outreach with local business groups may be required in the urban wellhead protection areas of Aurora and Newmarket.

5. FINANCIAL IMPLICATIONS

There are no financial implications of this report at this time.

The Province has committed to 100% funding for development of Assessment Reports under the Clean Water Act 2001, estimated to be \$14 million for the two Source Protection Regions within York Region.

Technical studies for the Assessment Report as prescribed under the Technical Rules of the *Clean Water Act* were outlined in the recent Terms of Reference documents provided by the two Source Protection Committees. Terms of Reference were submitted to the Minister for approval in late 2008. The next phase of funding shall be allocated to York Region by the lead Conservation Authority in the Source Protection Area, namely Lake Simcoe Region Conservation Authority and Toronto Region Conservation Authority upon final approval by the Province.

Additional program costs are planned in existing Capital and Operating budgets

Program funding for Conservation Authorities and other groundwater management initiatives, including monitoring are captured and planned under existing Capital and Operating budget programs.

6. LOCAL MUNICIPAL IMPACT

Ongoing protection of groundwater resources is vital for the sustainability of supply and safe delivery of drinking water to local municipalities and residents on private wells. Ongoing activities undertaken by York Region strive to anticipate risks and implement sustainable measures as communities grow and legislation changes. Participation on the two Source Protection Committees also ensures the local context is considered when introducing new policies that may impact the local municipalities. Regional Council endorsement of the eligible areas for the Ontario Drinking Water Stewardship Program will enable local municipalities and residents to benefit and protect their drinking water source.

7. CONCLUSION

Groundwater remains an important and vital source of drinking water and requires collaborative partnerships with a variety of agencies and stakeholders. York Region works closely with the Province, local municipalities, Conservation Authorities and other agencies to effectively manage this resource and provide a strong local context. With ongoing monitoring data, an advanced groundwater flow model and active coordination with stakeholders, York Region is able to ensure a safe and sustainable water supply for future generations to enjoy.

In August 2008, the Province introduced a new funding program open to persons or groups, including municipalities to undertake immediate actions to protect municipal drinking water. The funding is for stewardship activities within the two-year time of travel zone in Wellhead Protection Areas and Intake Protection Zones for surface water systems. To activate the flow of funds, the Province requires Regional Council to endorse these areas if not already included in municipal official plans.

Wellhead Protection Areas on the Oak Ridges Moraine are currently approved in the Regional Official Plan for Wellhead Protection Areas on-Moraine. Wellhead Protection Areas off Moraine will be included in the Regional Official Plan through the Regional Official Plan update currently underway. A Council resolution is therefore required to access the funding under the Province's Program. Regional staff recommends that this resolution be adopted based on this report and the Wellhead Protection Area and Intake Protection Zone identified in Figures 2 and 3.

For more information on this report, please contact Laura McDowell, Director,
Environmental Promotion and Protection at Ext. 5077.

The Senior Management Group has reviewed this report.

(The three attachments referred to in this clause are attached to this report.)