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WETLAND CREATION INITIATIVE

The Transportation and Works Committee recommends the adoption of the recommendations contained in the following report, September 14, 2006, from the Commissioner of Transportation and Works:

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council endorse, in principle, the concept of constructed wetlands as the preferred option for decommissioning Regional Lagoons as the naturalization projects would be significant achievements for the York Region Greening Strategy.
2. Staff be authorized to proceed with the recommended next steps at the following locations:
 - Mount Albert: Conduct further detailed study through an environmental monitoring and inventory study to confirm current and potential wetlands features at this site. Upon completion of detailed study proceed to design and implementation of constructed wetlands.
 - Sutton: Proceed to design and implementation of a constructed wetland to maintain and enhance the existing wetlands features.
 - Schomberg: On completion of the new Schomberg WPCP, proceed to design and implementation of a constructed wetland to maintain and enhance existing wetlands features.
3. The Regional Clerk forwarded this report to the Clerks of the Towns of Georgina, East Gwillimbury, and the Township of King for consideration and endorsement.

2. PURPOSE

This report seeks Council endorsement of constructed wetlands as the preferred option for decommissioning Regional wastewater lagoons, consistent with Greening Strategy objectives and seeks authorization for staff to proceed with the recommended next steps for each lagoon site.

3. BACKGROUND

3.1 General

In late 2004, Regional staff conceived and investigated the potential to convert Water and Wastewater lagoon facilities to wetlands. Council approved proceeding with a constructed wetlands feasibility study on June 23, 2005 through the adoption of Clause 5 of Report No. 6 of the Transportation and Works Committee. The recommendation in this report to Council was for decommissioned Regional lagoons to be considered for creation of constructed wetlands for wildlife and public use. Wetland creation and rehabilitation has been recognized as a priority under the Region's Greening Strategy.

Three current Regional lagoon sites are being considered for constructed wetlands. These sites are Mount Albert, Sutton and Schomberg. These sites have been, or will be, decommissioned as part of the water pollution control plant (WPCP) upgrades. The Regional Lagoon site at Holland Landing cannot be considered for conversion to a constructed wetland until the current Wastewater Servicing Class Environmental Assessment (EA) has been completed. Completion of this Class EA is anticipated for late 2006.

3.2 What are Constructed Wetlands?

Constructed wetlands are engineered wetlands designed to emulate the functions of natural wetlands. They are complex, integrated ecosystems in which plants, animals, micro-organisms and the environment interact. They provide a natural habitat for wetland plants and animals, help to conserve the natural environment and can be used to improve the quality of wastewater effluent with minimal environmental impacts.

3.3 Overview of the Use of Constructed Wetlands

It is estimated that over 80% of historic wetlands within York Region have been lost as a result of conversion to agricultural and urban uses. Through the Greening Strategy, York Region has objectives to rehabilitate and restore wetlands across the landscape. Wetlands provide important habitat for plants and animals, many of which are currently under represented in York Region as a result of limited habitat. Wetlands also assist in the attenuation of surface water after storm events and the vegetation found in and around wetlands helps improve local air and water quality.

Constructed wetlands are being used all over the world to help meet the demand for water quality improvements and to compensate for the loss of natural wetland habitat. They have been used in Canada for more than 35 years for intentionally polishing wastewater and storm water. Hundreds of wetlands have been created within the Region since the late 1980s to improve water quality of stormwater runoff in urban areas.

Where constructed wetlands are accessible to the public, they provide an excellent opportunity for public education and passive recreational use. With strategically planned interpretive trails and signage, the public can enjoy constructed wetlands for viewing wildlife. Additionally, wetland stewardship and education could be promoted through

Nature's Classroom, the Environmental Education program delivered through the Greening Strategy. Partnership research opportunities could also be considered to assist with other wetland creation projects in the future.

Where mechanical treatment facilities exist, a side stream of wastewater effluent could be used to sustain the wetland. The wetlands are not proposed to be used for wastewater treatment but rather will be constructed as habitat wetlands.

3.4 Existing Lagoon Site Conditions

Each of the lagoon sites are unique, having anywhere from one to four lagoon cells and water surface areas from about 2 ha to about 9 ha (Table 1). Adjacent lands range from forested to agricultural fields. Because of the large water surface and natural vegetation inherent with lagoon treatment environments, lagoons attract a variety of wildlife. The sites are important migratory stopover locations for water fowl and host a wide range of wildlife.

Table 1
Approximate Area of Property and Lagoons

Site	Property Size Hectares (Acres)	Lagoon Size Hectares (Acres)
Holland Landing	43.9 (108)	15.1 (37)
Mount Albert	19.9 (49)	1.8 (5)
Sutton	20.1 (50)	5.5 (14)
Schomberg	26.3 (65)	7.6 (19)

The study work conducted by CH2M Hill indicates that hydrogeological conditions at each of these three sites will support constructed wetlands.

4. ANALYSIS AND OPTIONS

4.1 Relation to Regional Strategies

The implementation of constructed wetlands would enhance and provide additional benefits to several Regional environmental initiatives.

4.1.1 Vision 2026

The Region's Greening Strategy, and this proposal to convert decommissioned sewage lagoons to habitat wetlands supports Vision 2026 and such key goal statements as:

“In 2026, York Region residents will continue to value and embrace the Region's unique natural heritage (land, air, water) and cultural heritage (sites and buildings important to our history, faiths and cultures).”

“In 2026, York Region will have grown at a pace that supports healthy communities, economic vitality, sustainable natural environment and effective human services.”

The proposal strengthens the Region’s commitment to focus on Vision 2026 action areas including:

- Protecting sensitive features such as forests, watersheds, the Oak Ridges Moraine and Lake Simcoe.
- Promoting a permanent linked Greenlands system.
- Continuing to develop and build strategies for a green Region, such as the York Regional Forest Management Plan, the Greening Strategy and the Greenlands Property Securement Strategy.
- Taking a leadership role in the development and implementation of environmental strategies and conservation activities.

Additionally, the conversion of these sites to habitat wetlands, and reforestation of adjacent lands, provides an opportunity to strive towards the Region’s Official Plan objective of increasing Regional forest cover to 25%.

4.1.2 York Region Greening Strategy

The York Region Greening Strategy was developed to provide a portal and platform for environmental initiatives within the Region. Included in the Greening Strategy is an explicit goal to promote and implement naturalization projects such as wetland rehabilitation and meadow restorations. The decommissioning of the lagoons offers an opportunity for environmental leadership, green expansion and habitat for plants and wildlife. Incorporating wetlands into the decommissioning plans for the lagoons supports York Region’s Greening Strategy. Advocating and development of constructed wetlands furthers the following Greening Strategy Objectives:

- Creation of wetland habitat and additional green infrastructure.
- Community education.
- Increased forest cover.
- Research and monitoring.
- Sustainable development of the Region.
- Enhanced partnerships.

“Nature’s Classroom”, York Region’s Environmental Education program, may be a perfect fit for educating the local community in regards to wetland creation, habitat enhancement and private wetland stewardship.

4.1.3 Corporate Clean Air Task Force

The Corporate Clean Air task force has been established to identify, develop and recommend corporate clean air actions. Constructed wetlands fit into several of the ongoing and planning goals outlined in the action plan such as water conservation, carbon

sequestration, improving air quality and contributing to the York Region Greening Strategy.

4.2 Alternative Use of Sites

Any alternative use of the site for other than treatment purposes or wetland creation is dependent on the surrounding land use. Possible uses brought forward were ball diamond fields or motorcycle trails. Any use adjacent to the WPCP operation should be compatible with the WPCP designation. Incompatible land uses have the potential to lead to conflict over the WPCP's operation which is the pre-existing and primary purpose of the site.

4.3 Constructed Wetlands Feasibility Study Findings

The feasibility study on *Municipal Wastewater Lagoons Conversion to Habitat Wetlands in York Region* prepared by CH2M Hill provides the Region with a concept outlining how wetlands could function at each site. Because treatment of wastewater for Holland Landing is currently being reviewed as part of a Wastewater Servicing Class Environmental Assessment (EA) no specific consideration was made for this site. Concept designs for the remaining three sites were provided with staged implementation opportunities.

The feasibility study was conducted within the framework of an EA so that if one or more of the proposed wetland projects were to proceed some preliminary EA requirements would have been met. This included notice of project commencement and objectives, providing public meetings, appropriate notification and meetings with agencies to discuss the approach, and documenting the process followed and the outcome.

The following has been identified and achieved from the conclusions of the feasibility study stage for each site under consideration:

- Community education on the concepts of constructed wetlands through public meetings.
- Community and agency input and support.
- Design concepts.
- Constraints and stakeholder issues identified.
- Preliminary estimates of cost of implementation.

4.3.1 Community Input

An open house and presentation for the feasibility study was conducted on December 13, 2005. The purpose of the meeting was to provide community education and to solicit input. The open house received considerable interest from the public and local area politicians, with more than 50 people attending.

Feedback from the public was solicited during the meeting and through a questionnaire. Many of the questions raised by participants focused on the impacts on the existing flora and fauna, wildlife control and air and water quality.

Local community groups such as the Dufferin Marsh Committee expressed positive support noting that the Schomberg lagoon systems currently act as habitat for many significant species.

4.3.2 Agency Input

Input from the Ontario Ministry of the Environment, Lake Simcoe Region Conservation Authority and the Ministry of Natural Resources were obtained through meetings and correspondence. Feedback requested included identifying constraints to the proposed constructed wetlands and permitting requirements.

The Ministry of the Environment (MOE) expressed support if the wetlands do not discharge, do not use raw wastewater for water source, do not divert surface run off into the wetland and use only tertiary effluent from the adjacent WPCP as a water source. Monitoring requirements may include regular sampling, annual performance reports, and identification of potential infractions.

In order to meet the MOE's requirements, a water balance will be required during detailed design to determine how much open water will be incorporated into the wetlands. While the concept drawings (*Attachments 1, 2 and 3*) include an open water component, marshes and swamps are extremely valuable components of the natural heritage system and require significant less water to sustain them. Marshes and swamps may be the preferred design of some sites after detailed engineering studies have been undertaken.

The Ministry of Natural Resources and Lake Simcoe Region Conservation Authority indicated firm and positive support for the conversion of lagoon sites to habitat wetlands.

4.3.3 Conceptual Design

The concepts developed include potential wetland layouts, habitat and aesthetic enhancement components, structures, and other relevant and related design features. The basis for design focuses on Greening Strategy objectives and maximizing habitat values. If surface runoff or wastewater will be discharged to the wetland it is likely to then be considered a treatment facility and will require permitting. Because of the complexity and operational issues, this is not a recommended option.

Concept implementation for all of the potential sites are planned to be as a three phased approach, with the first phase including earthworks and paths, the second adding trees and shrubs, and a third would see the construction of boardwalks and viewing areas/platforms/shelters. Concept drawings were provided for each selected Regional lagoon site and for each project phase. The level of effort for each phase will be driven by available budget and need by the community and wildlife for each of the amenities. While all concepts identify passive recreation trails, the need and desire for these trails will be assessed for each site based on access, probable use, and sensitivity of wildlife using the area.

During the feasibility stage constraints were identified both physically and ecologically, and the permits required to create the system were presented. No constraints or issues were identified with respect to the operation of the WPCP with the proposed conversions. A summary of the current conditions at each of the site and elements of the concept designs are presented below.

For Mount Albert the conceptual design incorporates an emergency overflow/bypass storage capability in the form of a small portion of the lagoon being separated by a berm from the remainder of the wetland (*see Attachment 1*). The option of using the wetland for polishing of treated wastewater to increase the capacity of the WPCP was considered but is not recommended due to the application process in obtaining permits and additional operational requirements. The Region owns significant lands adjacent to the Mount Albert Lagoons. These lands could be considered for additional habitat creation (wetland and/or upland). Reforestation and restoration of the available lands would benefit habitat values and contribute to York Region's Greening Strategy and forest cover objectives.

Sutton conceptual design incorporates an emergency overflow/bypass storage capability in the form of a small portion of the lagoon being separated by a berm from the remainder of the wetland (*see Attachment 2*). This site is planned to be a zero discharge wetland system. A detailed water balance will be undertaken in support of the detailed design to ensure that the ultimate wetland features and configuration (swamp, marsh, and extent of open water) are appropriate for the amount of water available to the site.

For Schomberg, the option of using the wetland for polishing of treated wastewater to increase the capacity of the WPCP was considered but is not recommended due to the significant application process to obtain permits and the additional operational requirements. The conceptual design for Schomberg incorporates an emergency overflow/bypass storage capability in the form of a small portion of the lagoon being separated by a berm from the remainder of the wetland (*see Attachment 3*).

Holland Landing was omitted from the Conceptual Design Phase of the feasibility study because of the Wastewater Servicing Class Environmental Assessment process for Holland Landing, Queensville and Sharon being undertaken. This concept cannot be considered so as not to prejudice the outcome of servicing options, evaluation, selection and approval.

4.3.4 Public Enjoyment Features

Public use features if adopted are intended to facilitate passive use and be very low maintenance.

Recreational features could include:

- Signage.
- Educational Opportunities.

- Trails.
- Boardwalks.
- Viewing Platforms/Areas.

The extent and condition of public access to the sites will be determined when design is complete. The benefits and risks of various options will be considered. Options include full public access, comparable to the York Regional Forest, no access, or gated access for specific public events, education and research opportunities.

4.3.5 Long-Term Planning Limitations of the System

There are few long-term planning limitations. The systems operate much as a natural system would and are, for the most part, self sustaining. If the wetland functions as a closed system or does not receive treated wastewater, the systems can be left to maintain themselves but may, depending on the local hydrology, mature into a mixed upland/wetland system. Recreational infrastructure, if included, will require long term maintenance, repair and replacement. York Region has not to date maintained or operated wetlands as public recreational/educational facilities. In light of this and the mandates of other stakeholders such as our local conservation authorities, partnership opportunities with other agencies and groups will be explored concurrent with detailed design of the wetlands.

4.4 Next Steps

Increasing and improving wetland habitat within the Region is a priority of the Greening Strategy. The wetland concepts are a feasible option to decommissioning lagoons. A number of alternative configurations for the wetlands are possible. The various design elements that can be incorporated into the wetlands and the opportunities for flow maintenance to each of the sites must be further investigated in the next stage, or the preliminary design step, of the project.

The public information centre that was held for the project highlighted a considerable interest from the residents and local politicians to see the project progress to the next step. Many ideas were provided at the open house that could be used to enhance the opportunities to develop wetland systems at the site that benefit the natural environment and enhance the opportunities for the public to enjoy the sites for many recreational purposes including wildlife viewing, hiking, and passive enjoyment. These opportunities, and partnerships for the long term management of the sites, must also be investigated in the next stage of the project.

Specific recommendations for the next steps for each of the sites are:

- Mount Albert: Conduct further detailed study through an environmental monitoring and inventory study to confirm current and potential wetlands features at this site. Upon completion of further detailed study proceed to design and implementation of constructed wetlands.

- Sutton: Proceed to design and implementation of a constructed wetland to maintain and enhance the existing wetlands features.
- Schomberg: On completion of the new Schomberg WPCP, proceed to design and implementation of a constructed wetland to maintain and enhance existing wetlands features.
- Holland Landing: No specific recommendation can be made until results of the Environmental Assessment have been completed.

5. FINANCIAL IMPLICATIONS

Converting the lagoon sites to constructed wetlands provides a significant opportunity for York Region to continue to demonstrate leadership on environmental protection and enhancement through the Greening Strategy.

An estimate of the total costs to implement each site is between \$250,000 and \$650,000 depending on the extent of the design. Funds are available in the Water and Wastewater Branch 2007 budget for lagoon decommissioning. Any required additional funds are to be secured through the Greening Strategy managed by the Natural Heritage and Forestry Services Group. Annual operational costs for the habitat wetlands are estimated to be less than \$5,000; however, periodic larger expenditures will be required for the repair and replacement of recreational infrastructure, if included in the detailed design. Partnership opportunities (with groups including Ducks Unlimited, Lake Simcoe Region Conservation Authority) for the long term operation and maintenance of the wetlands will be explored.

Cost for any additional environmental clean-up that may be necessary for alternative uses such as recreational land use, have not been evaluated since this is not recommended for the sites.

6. LOCAL MUNICIPAL IMPACT

Should the project proceed to implementation, these sites would be a natural amenity for the local community and may be used to promote municipal and community education of our natural environment which will have many positive long term effects. Local municipalities are regular partners in a number of Greening Strategy initiatives.

7. CONCLUSION

The creation and restoration of habitat wetlands are a significant objective of the Greening Strategy. The wetland concepts are a feasible alternative for the property after decommissioning the lagoons at the Sutton, Mount Albert, and Schomberg sites. There

are a number of design elements that could be incorporated into the wetlands that must be investigated further to maximize their benefit to wildlife and recreational users.

Positive support was obtained from the public and participating agencies. Many ideas were provided at the public information centre towards potential opportunities to further develop the wetland concepts at the sites towards benefiting the natural environment and enhance the opportunities for the public to enjoy the sites for many recreational purposes including wildlife viewing, hiking, and passive enjoyment.

The application of constructed wetlands will enable the Region to continue to demonstrate leadership in environmental protection and enhancement, and promote environmental initiatives and actions consistent with Vision 2026 and the York Region Greening Strategy. Constructed Wetlands are an excellent re-naturalization project, promoting conservation, community education and enhancing wildlife habitat.

The Senior Management Group has reviewed this report.

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