
Bexhill Road Class Environmental Assessment Forcemain and Pumping Stations

In 2003, the Region of Peel operations staff expressed concerns with respect to the location and condition of the existing wastewater collection system servicing the Bexhill Road area of Mississauga. Specifically, the exact location of the existing 500-mm diameter asbestos/cement forcemain crossing the Provincially significant Rattray Marsh was not known. In addition, the capacity of both the forcemain and the Bexhill Road pumping station was deemed insufficient to handle existing wastewater flows.



The operations staff was also concerned that a portion of the existing 900-mm diameter trunk inlet sewer was, at times of high water level, submerged within Lake Ontario.

The Provincially significant Rattray Marsh borders Lake Ontario in the Bexhill Road area of Mississauga.

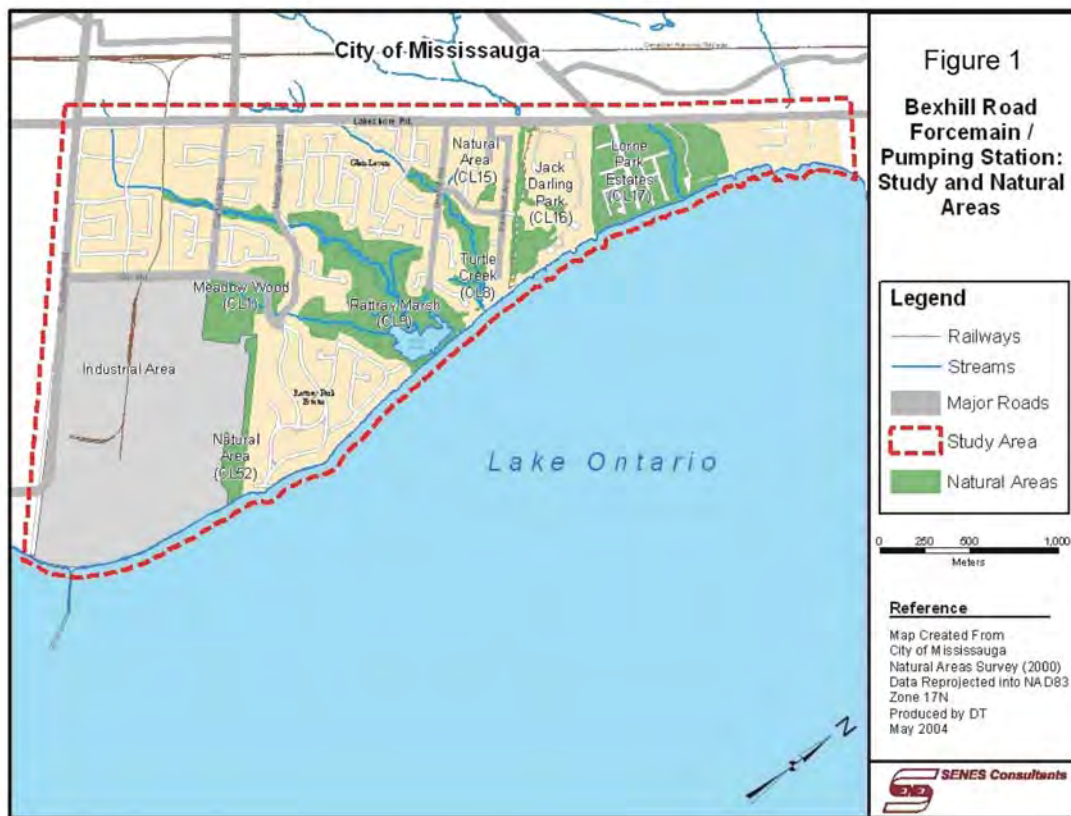
After a competitive bidding process, the Ainley Group was retained by the Region of Peel to conduct a Class Environmental Assessment Planning Process (Schedule C) to address the issues associated with the Bexhill Road inlet sewer, sewage pump station and forcemain with respect to the protection of the natural environment within the Rattray Marsh and Lake Ontario.

The Ainley Group's Environmental Assessment problem statement identified three main areas of concern:

- A significant portion of the inlet trunk sewer to the Bexhill Road wastewater pump station is submerged in Lake Ontario – a potential for infiltration.
- The existing wastewater pump station may be insufficiently sized to handle future peak flows, which could cause surcharging of the inlet sewer and overflow into Lake Ontario.
- The existing discharge forcemain, almost 35 years old (built in 1969) and routed across an easement bisecting the Provincially significant Rattray Marsh, posed an environmental risk to the marsh should a break occur in the forcemain.

Study Area

The limits of the Study Area, shown in Figure 1 below, are defined as that area within which it is anticipated that all the feasible infrastructure solutions will be contained. The extent of the Study Area was reassessed following the identification of the various feasible options to address the problem(s). The Study Area is described as the lands bounded by Lakeshore Road West to the northwest, the shoreline of Lake Ontario to the southeast, Southdown Road to the southwest and Crozier Court to the northeast. The central part of the Study Area includes the Rattray Marsh and the surrounding, existing residential development. The entire Study Area slopes from Lakeshore Road West to the shore of Lake Ontario with a more pronounced drop around Sheridan Creek, Turtle Creek and the Rattray Marsh. The works associated with all of the identified Combination Alternatives are within the Study Area.



Rattray Marsh – A Natural Environment

Rattray Marsh is a coastal marsh along Lake Ontario between Bexhill Road and Meadow Wood Road. This is one of the most thoroughly studied sites in the City of Mississauga. There are 501 floral and 246 faunal species documented for this site.

Aquatic Environment

Rattray Marsh is classified as a Type 1 fishery habitat requiring a high level of protection, and Sheridan Creek is classified as a Type 2 fishery habitat requiring a moderate level of protection. A total of 21 fish species are recorded for the Rattray Marsh including the Redside Dace, which is considered a threatened species by the provincial Committee on the Status of Species at Risk in Ontario (COSSARO) and a species of special concern by the national Committee on the Status of Endangered Wildlife in Canada (COSEWIC).



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Vegetation

There are thirteen vegetation communities within the Rattray Marsh. These communities are dispersed in Forest, Cultural Meadow, Wetland and Shoreline Environments.

Flora and Fauna Habitat

Within the Rattray Marsh, 47 breeding bird, 22 mammal, eleven amphibian and eleven reptilian species have been documented. The marsh is also home to four species at risk listed by COSSARO and COSEWIC: Butternut, Eastern Milk Snake, Common Map Turtle and an historical record for Eastern Hognose Snake. In addition to these, Blanding's Turtle, considered threatened by COSSARO has been documented at the site.

The site is also home to 41 plant species that are considered rare and 92 plant species that are considered uncommon within the City of Mississauga as well as fourteen resident bird species that are considered species of concern by the Credit Valley Conservation (CVC).

Significance of the Marsh Area

The marsh area has been designated as an Environmentally Significant Area and Provincial Area of Natural and Scientific Interest - Life Science. Additional reasons why the area is significant include:

- Provincially Significant Wetland (PSW)
- This site has been noted as the 'last remaining large marsh along the western lakefront from Toronto to Burlington' (Brownell 1993)
- Diversity of plant species (496 species)
- Large size (46.81 ha)
- Close proximity to natural areas
- Contributes to the linkage function of Sheridan Creek



One of the outlets from Rattray Marsh into Lake Ontario.

- Floodplain provides floodwater storage for Sheridan Creek
- Diversity of vegetation communities (13 communities)
- Hybrid Poplar, considered rare within the province by the NHIC, is documented for this site
- Eastern Milk Snake, considered rare within the province by the NHIC and nationally as a species of concern by COSEWIC is documented for this site
- Forty-one plant species documented from this site are considered to be rare within the City (known from 3 or fewer locations)
- Ninety-two plant species documented from this site are considered to be uncommon within the City
- The Eastern Hemlock forest, early successional forest, Cattail marsh and open water marsh are uncommon vegetation communities within the City
- Migratory stopover for birds
- Credit Valley Conservation considers eight resident bird species as species of concern - Killdeer, Herring Gull, Belted Kingfisher, Hairy Woodpecker, Eastern Kingbird, Barn Swallow, Gray Catbird, and Common Grackle
- Associated with the Lake Ontario shoreline.



Sheridan Creek – the main source of flow into the marsh.

The Assessment Process

Beginning in the Spring of 2004, assessments were completed with respect to site topography, flood and fill line mapping, the natural and socio-economic environments, geotechnical/hydrogeological, shoreline protection, heritage/archaeological and existing utilities/services.

As part of the assessment process, the Region organized and held numerous Workshop and Focus Group meetings to obtain public input in the identification and assessment of the various solutions. Considering the fact that the problem statement identified three areas of concern, the solutions were referred to as 'Combination Alternatives'. A total of 16 Combination Alternatives (CA) were identified and assessed along with sub-options that were identified for some of the CAs. In total, 22 solutions were assessed, including Do Nothing. The solutions were:

- Do Nothing
- Solutions within Rattray Marsh (9 alternatives)
- One pump station solution, outside of Rattray Marsh (7 alternatives)
- Two pump station solutions, outside of Rattray Marsh (9 alternatives)

Due to the sensitivity of both the natural and socio-economic environments, it was agreed that equal weighting should be given in the assessment of the solutions with respect to those two groups of criteria (40% each). A weighting of 20% was given to the Technical aspects of the solutions. The Do Nothing solution and CAs # 1 through 9 (works within Rattray Marsh) were identified and assessed, even though they did not comply with environmental policies and regulations.

The assessment resulted in the selection of CA #15 (Option 2) as the Preferred Solution. This selection was made following meetings with the Workshop and Focus Groups as well as City and CVC staff. CA #15 (Option 2) was presented to the public on March 2, 2006. Following the receipt of comments, CA 15 (Option 2) was confirmed to be the 'Preferred Solution'.

The proposed works contained in Combined Alternative #15 (Option 2) included:

- Wastewater diversion pump station (PS1) with a rated capacity of 700 L/s to be located on Region property - the facility is to be sized to allow future increase in pump and diesel generator set size
- Forcemain from PS1 along Lakeshore Road to Clarkson Road complete with connection to the existing 3,000-mm dia. sewer at Clarkson Road
- New inlet sewer to PS1 to divert wastewater away from the Lake Ontario Shoreline
- New 600-mm dia. wastewater sewer from Lorne Park WTF to PS1
- Wastewater pump station (PS2) with a rated capacity of 100 L/s to be located adjacent to the site of the existing washroom/change room facility in Jack Darling Park
- A 300-mm dia. forcemain from PS2, following the existing 900-mm dia. sewer to the new 600-mm dia. wastewater sewer from the Lorne Park WTF
- New 400 and 450-mm dia. sewer along the shoreline of Lake Ontario to service the Bexhill Road/Parkland Avenue areas
- Retention of existing 900-mm dia. sewer through Jack Darling Park up to the existing pipe into Lake Ontario, to service as an emergency overflow pipe for both new pump stations
- Abandonment of existing inlet sewers within Rattray Marsh
- Demolition/abandonment of existing Bexhill Road pump station
- Abandonment of existing forcemain across Rattray Marsh to Orr Road.

Construction of the Works

It was recommended that the overall works be constructed in stages to reduce the impact on local residents and to maintain access to the parklands as much as possible.

STAGE 1 - PS1 complete with related inlet sewers and hydro supply
- Lakeshore Road forcemain

STAGE 2 - PS2 complete with related shoreline and Gatehouse Drive sewers and hydro supply
- Forcemain

STAGE 3 - Abandonment(s)

Staging will allow the Region to divert most of the wastewater away from the lakeshore as soon as possible and will greatly reduce the volume of flow that needs to be bypassed when constructing the shoreline sewers under Stage 2.



The marsh and associated parklands are used extensively by local residents and visitors throughout the summer. This usage prompted the recommendation of constructing the overall works in stages.

Construction Duration and Timing

Construction of PS1 will be done in conjunction with the installation of the Lakeshore Road forcemain. Since both components involve specialized work, they will likely be tendered as separate contracts. Considering the size of the station, it was estimated that the construction would take between 12 to 18 months to complete. It was recommended that the contract be awarded in the Spring to allow excavation and concrete work to be completed in good weather. The forcemain installation will take about 6 months, assuming it is done using horizontal directional drilling (HDD) methods. It is suggested that the forcemain be installed in good weather as well; therefore, the construction of the Stage 1 works should commence in the Spring and be completed and operational 18 months later in the following Fall.

The construction of PS2 should take about 12 months to complete. Considering the fact that Jack Darling Park is heavily used (Spring, Summer and early Fall) it was suggested that the construction of the pump station commence in the Fall. This will mean that the excavation and concrete work may be undertaken in poor weather; however, the impacts to park users will be greatly reduced. The actual building should be completed by Spring, allowing the inside work to be done during the Summer, further reducing the impact to the public. With respect to the shoreline sewers, the CVC has indicated that those pipes could be installed during the Winter months to reduce the impacts to users of the shoreline and Rattray Marsh. A similar argument can be made with respect to the forcemain through Jack Darling Park; therefore, it was recommended that the sewer and forcemain works be completed in conjunction with the construction of PS2, beginning in the Fall. The sewers and forcemain should be completed by the following Spring. The diagram below shows the proposed layout of the works.



The abandonment works cannot be undertaken until the completion of Stage 2. It was suggested that those works be done during the Winter months to reduce impact to users of the Rattray Marsh. Assuming the work begins in the Fall, it should be completed by the Spring.

The completed Environmental Study Report, outlining the study process, alternatives and the selected preferred design, was delivered to the Region of Peel in July, 2006. The estimated capital cost of the proposed works is \$18,500,000. A Notice of Study Completion was issued on April 12, 2006 and the 30 day public review period ended May 12, 2006.



The Rattray Marsh area, shown here exiting into Lake Ontario, has been designated as an 'Environmentally Significant Area' and Provincial Area of Natural and Scientific Interest - Life Science by the Province of Ontario.