



STAFF REPORT ACTION REQUIRED

Waterfront Landforms Study

Date:	February 29, 2012
To:	Public Works and Infrastructure Committee
From:	General Manager, Toronto Water
Wards:	6, 13, 14, 32
Reference Number:	P:\2012\Cluster B\TW\ pw12002

SUMMARY

This report explores the feasibility and the costs associated with carrying out an Environmental Assessment for the construction of: (a) Humber Bay Islands Landform to improve water quality at Sunnyside Beach and protect the shoreline from erosion; and (b) Ashbridges Bay Landform, south of the Ashbridges Bay Wastewater Treatment Plant, to provide for the construction of a stormwater wetland and combined sewer overflow high-rate treatment facility, integrated with other projects planned for the area.

The Landforms provide an ancillary benefit as they present an alternative disposal location for clean fill generated from City-wide capital construction projects, reducing overall construction costs for the disposal of excavation material by an estimated 10 to 20%, depending on the in-lake geometry of the landform.

The report recommends that the Toronto and Region Conservation Authority, in collaboration with Toronto Water, the Parks, Forestry and Recreation Division, and Waterfront Toronto, initiate an Environmental Assessment Study complying with the requisite Federal and Provincial Environmental Assessment requirements, to support the advancement of these Landforms.

RECOMMENDATIONS

The General Manager, Toronto Water recommends that:

1. City Council direct the General Manager, Toronto Water and the Chief Administrative Officer for the Toronto and Region Conservation Authority to enter into a joint initiative to undertake a Waterfront Landforms Environmental Assessment Study which will include:
 - a. Humber Bay Islands Landform directed at improving water quality conditions at Sunnyside Beach and protecting the shoreline from erosion;
 - b. Ashbridges Bay Landform, south of the Ashbridges Bay Wastewater Treatment Plant, to provide for the construction of a stormwater wetland and combined sewer overflow high-rate treatment facility, integrated with other projects planned for the area;
 - c. an assessment of impacts on surrounding water quality, sediment transport, flood levels, fish and wildlife habitat, shoreline protection, recreational opportunities, marine navigation and recreational boating; and
 - d. broad public consultation with affected stakeholders.
2. City Council request the Toronto and Region Conservation Authority to lead the Waterfront Landforms Environmental Assessment Study in collaboration with Toronto Water, the Parks, Forestry and Recreation Division, and Waterfront Toronto, subject to availability of funding from the City of Toronto.
3. City Council direct the General Manager, Toronto Water, to report to the Public Works and Infrastructure Committee upon completion of the Waterfront Landforms Environmental Assessment Study, prior to filing a formal public Notice of Completion, with a final plan for the landform configurations, an estimated implementation schedule with costs, an estimate of reduced costs for haulage and disposal of excavated material for City capital projects should the landform construction project proceed, and a summary of ecological gains and community benefits which can be expected from the projects.

Financial Impact

It is estimated that \$3.0 million in capital costs will be required to undertake the Waterfront Landform Environmental Assessment Study. No funding provisions have been made within the Toronto Water 2012 Capital Budget and 10 Year Capital Plan to implement this study.

Subject to the adoption of the recommendations in this report, funding to allow for the completion of the Waterfront Landform Environmental Assessment Study will be included in the Toronto Water 2013-2022 Capital Budget and Plan submission for consideration with the 2013 Capital Budget.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

City Council, at its meeting of September 21, 2011 adopted the recommendations contained in the "Wet Weather Flow Master Plan and Basement Flooding Protection Program Update Report" (August 12, 2011) from the General Manager, Toronto Water to the Public Works and Infrastructure Committee, which included a request of the General Manager, Toronto Water, in collaboration with the Toronto Region Conservation Authority, to report back in 2012 on the feasibility and costs of carrying out an Environmental Assessment for a Humber Bay Islands Landform to improve water quality at Sunnyside Beach and protect the shoreline from erosion.

A copy of the staff report can be found at:

<http://www.toronto.ca/legdocs/mmis/2011/pw/bgrd/backgroundfile-40671.pdf>;

and the Council Decision Document can be found at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.PW7.6>

City Council, at its meeting on August 5, 2009, adopted the "Western Waterfront Master Plan" for the purpose of guiding future decisions related to improvements to the public realm within this area. This plan contemplated the need to construct a series of deflector islands out from the mouth of the Humber River approximately one kilometre into Lake Ontario.

http://www.toronto.ca/progress/pdf/western_waterfront.pdf

ISSUE BACKGROUND

The City of Toronto has made considerable effort to improve water quality along the waterfront, with a particular focus on the City's waterfront beaches. The ongoing implementation of the Wet Weather Flow Master Plan (WWFMP) has improved water quality conditions. Several Class Environmental Assessment Studies have been undertaken to further address direct discharges of untreated combined sewer overflows or stormwater runoff to the waterfront, including the Coatsworth Cut, and Don River and Central Waterfront Projects. Components of these projects include a stormwater wetland and a combined sewer overflow high-rate treatment facility, respectively, to be constructed immediately south of the Ashbridges Bay Wastewater Treatment Plant, within the Plant's existing water lot (see Figure 1).

As a testament to the improvements achieved in water quality to date, eight of the City's eleven swimming beaches now meet the internationally recognized Blue Flag water quality standards for beaches. The three remaining non-Blue Flag beaches are all located near the mouth of major river systems and their flows represent the dominant source of pollution at these beaches. Recognizing that these river systems extend well beyond the City limits, where the watersheds include many other urban and agricultural areas, computer simulation modelling of lake water quality was undertaken to support the development of the WWFMP. These simulations showed that flows from the Humber River will continue to impact water quality at Sunnyside Beach even with the full implementation of the City's WWFMP and the implementation of stormwater management best practices by upstream municipalities.

The concept of extending the shoreline along the east side of the mouth of the Humber River further into the lake to create a beach protection landform and thereby deflecting the flow of the river away from the beach was evaluated in the development of the WWFMP (Figure 2). The computer simulation modelling showed that when used in conjunction with all other measures contained in the WWFMP, Sunnyside Beach water quality would improve, meeting Blue Flag beach water quality criteria.

Based on the findings from public consultation, TRCA's communication to their Board in June 2004 recommended that "all options for resolving pollution in the Western Beaches, caused by the Humber River discharge be evaluated in further detail as part of the Environmental Assessment process for developing an integrated set of solutions for this problem.

Since that time, effort has been spent on finding other solutions to the pollution problems at Sunnyside Beach. The Western Beaches Tunnel was completed in 2002 and has been effective in intercepting eight combined sewer overflows and two storm sewer discharges that previously flowed untreated to Sunnyside Beach. While this has had a positive effect on water quality, it was not in and of itself enough to achieve the water quality improvements to achieve Blue Flag designation. Further, daily monitoring of Sunnyside Beach water quality has shown that beach water quality is closely related to Humber River water quality, even during dry weather, and the closer to the river, the greater the correlation.

In an attempt to provide localized water quality improvement to a small area of Sunnyside Beach, a pilot project, directed by Council, was undertaken in 2009 and 2010. This involved isolating a section of Sunnyside Beach behind a floating curtain and circulating the enclosed water through an ultra-violet disinfection system. This project showed that building such a system at a large enough scale to treat all of the water behind the breakwall would be very expensive. Further, even for the modest pilot project, the operating costs were not sustainable as the system required full time attendance to prevent fouling of the intakes with algae, and the results were mixed, where water quality was often worse within the enclosure than water quality in the lake. The results of the Toronto pilot were similar to experiences of other Ontario municipalities that operated these types of systems, where it has been found that it was necessary to add a disinfecting agent like chlorine to manage bacteria and algae levels adequately.

COMMENTS

Through the implementation of the City's Wet Weather Flow Master Plan, progress is being made in improving waterfront water quality. Projects such as the Coatsworth Cut, and Don River and Central Waterfront Projects are directed at further improving water quality conditions within the Coatsworth Cut area, immediately west of Woodbine Beaches Park; and within the Don River and Central Waterfront area, respectively. In the case of the Coatsworth Cut project, an Environmental Assessment Study has been completed where, in addition to a number of sewer system upgrades, a stormwater wetland is proposed to be constructed immediately south of the Ashbridges Bay Wastewater Treatment Plant within the existing water lot. Immediately to the west, and still within the Plant's water lot, a combined sewer overflow high rate treatment facility has been proposed through the Don River and Central Waterfront Environmental Assessment Study, to provide treatment for flow captured from over 50 combined sewer overflows discharging to the Lower Don River and Inner Harbour.

While the landform area required to support the construction of these facilities has not been defined precisely, the design of the outer perimeter of the landform needs to be integrated with other planning initiatives underway in this waterfront area including: (a) an Erosion Control Project to reduce sedimentation and dredging requirements for recreational boating in the area, led by the Toronto and Region Conservation Authority; (b) causeway linkages between the Toronto Headlands and Ashbridges Bay Park for pedestrian access, supporting the Lake Ontario Park initiative led by Waterfront Toronto; and (c) the new outfall for Toronto Water's Ashbridges Bay Wastewater Treatment Plant, where its design will be directly affected by changes in lake circulation patterns resulting from changes in shoreline geometry. An environmental assessment study is therefore required wherein the impact of this landform is assessed in the context of all other planned activities.

Further west, at Sunnyside Beach, a number of initiatives have been implemented in coordination with the Parks, Forestry and Recreation Division and Toronto Public Health, to help improve water quality conditions along this stretch of waterfront. While Toronto Water continues to advance the initiatives identified in the Wet Weather Flow Master Plan to reduce the impact of stormwater runoff and combined sewer overflows within the Humber River watershed, it is apparent, that in order to meet the strict Provincial Beach water quality standards on a consistent basis and thereby meet the international Blue Flag designation requirements, the flow from the Humber River must be diverted away from Sunnyside Beach. The beach protection landform proposed in the Master Plan would extend out into the Lake Ontario an estimated one kilometre from shore, as a solid land mass below the water surface, emerging as a series of interconnected islands above lake level. Depending on its final design, it could form the basis of a destination location and/or recreational amenity for this stretch of waterfront, while also providing valuable aquatic and terrestrial habitat. An environmental assessment study is required to advance this concept, with consideration for the potential impact on flow from the Humber River and river hydraulics, lake circulation effects, longshore sediment transport dynamics, shoreline erosion, impacts on navigation and other matters.

It is estimated the landforms could create an opportunity for lake-fill disposal of approximately 2 million cubic metres. The City has benefitted from other similar lake-fill projects over the years as recreational amenities and natural features across the waterfront were created.

Based on current capital program planning forecasts, Toronto Water alone will generate an estimated 800,000 cubic metres of clean excavated fill over the next ten years in tunnelling and underground storage structures. It is estimated that TTC and Metrolinx projects will generate more than 800,000 cubic metres from the Eglinton Crosstown Project alone. There is also significant private construction activity all of which creates surplus excavated material. Many contractors working in the City are experiencing difficulty finding suitable disposal sites for excavated material from new infrastructure projects. This has presented a major challenge where contractors now have to transport excavated material well outside of the City for disposal, ultimately resulting in higher construction costs for City projects associated with the increased haulage costs and tipping fees. The situation is not unique to Toronto, as neighbouring municipalities are facing the same issues and finding new fill disposal options will benefit all

municipal infrastructure programs. Additionally, the longer distances to disposal sites also leads to increased truck exhaust emissions.

It is proposed that City of Toronto and TRCA proceed with an environmental assessment study to advance the above-noted landform concepts. Given the potential impact on aquatic habitat and navigation, the study must satisfy the provincial and federal Environmental Assessment Act requirements. Based on TRCA's experience in undertaking such studies, and their current experience in leading the environmental assessment for Region of Peel's Lake Front Promenade development in Mississauga, immediately west of the mouth of Etobicoke Creek, it is proposed that the TRCA lead this study, at an estimated cost of \$3 million, to be borne by Toronto Water.

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SIGNATURE

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ATTACHMENTS

- Figure 1 Beach Protection Landform Concept at Humber River Mouth
- Figure 2 Ashbridges Bay Landform Concept Incorporating Stormwater Management Wetland and Combined Sewer Overflow High Rate Treatment Facility

FIGURES



Figure 1 Ashbridges Bay Landform Concept Incorporating Stormwater Management Wetland and Combined Sewer Overflow High Rate Treatment Facility



Figure 2 Beach Protection Landform Concept at Humber River Mouth