TORONTO

STAFF REPORT
ACTION REQUIRED

Highland Creek Wastewater Treatment Plant Biosolids Management Update

Date:	September 11, 2013
To:	Public Works and Infrastructure Committee
From:	General Manager, Toronto Water
Wards:	All Wards
Reference Number:	P:\2013\Cluster B\TW\pw13016

SUMMARY

This is to provide an update on actions taken since the May 2011 direction from Council to implement Beneficial Use as the primary biosolids management strategy and Landfill Disposal as a contingency option for the Highland Creek Wastewater Treatment Plant (HCTP).

In March 2012, staff released a Request for Proposal (RFP) to retain Consulting services to prepare a conceptual design for the infrastructure necessary to implement the Council directed biosolids management program for HCTP. A Conceptual Design Report is now complete and provides details on the requirements and costs associated with constructing a truck loading facility including the necessary odour controls as well as additional digesters to ensure biosolids meet regulatory standards for agricultural land application in Ontario.

The November 2012 Staff Report to PWIC advised of the need to undertake a Schedule B Class Environmental Assessment (Class EA) in order to pursue Council's direction. The Staff Report advised that this course of action was chosen after consultation with the Ontario Ministry of Environment (MOE) and addresses the risk of Part II Orders if the December 2009 Biosolids Master Plan is used as the approval document to implement Council direction. The Environmental Assessment Act allows any interested parties to make a request to the MOE for a higher level of assessment for a Class EA project if they feel there are significant outstanding issues that have not been adequately addressed and could be addressed through an individual environmental assessment process. This is known as a Part II Order Request.

The RFP for the Schedule B Class EA was developed with the input of Toronto Public Health (TPH) and the Toronto Energy and Environment Office (EEO). TPH wrote the terms of reference and will oversee the development of the Health Impact Assessments

for the alternatives under study. The Toronto Energy and Environment Office wrote the requirements for Cumulative Impact Assessment regarding air emissions incorporating the City's in-house developed air model.

A RFP to retain consulting services for the Schedule B Class EA was released April 19, 2013 but was subsequently withdrawn pending Council approval of this Staff Report. It is anticipated that the EA will take approximately 12 months to complete from the execution date of a consulting services agreement and will cost approximately $500,000. Costs could rise depending on the degree of stakeholder input and consultation as well as Part II Orders.

RECOMMENDATIONS

The General Manager Toronto Water recommends that:

1. City Council approve the preparation of a Schedule B Class Environmental Assessment (Class EA) that will examine all reasonable and feasible biosolids management alternatives for the Highland Creek Wastewater Treatment Plant; and

2. City Council direct Toronto Water to issue and award a Request for Proposal for the preparation of the Class EA that includes the Scope of Work set out in Attachment 2 of this report jointly prepared with the input of Toronto Public Health and Environment and Energy Office.

Financial Impact

There is no financial impact resulting from the receipt of this report. Funds for the Study are contained in the 2013 Toronto Water Capital Plan

DECISION HISTORY

At its meeting on July 22, 23 and 24, 2003, City Council authorized the Commissioner of Works and Emergency Services to award and engage the firm of KMK Consultants Limited, to provide engineering consulting services for the preparation of a Biosolids and Residual Master Plan (BRMP) as per the Scope of Work outlined in Request for Proposal No. 9121-03-7236.
http://www.toronto.ca/legdocs/2003/agendas/council/cc030722/wks6rpt/cl012.pdf

At its meeting on March 8, 2005, Works Committee requested that the General Manager of Toronto Water, together with the Medical Officer of Health, undertake a peer review of the decision model and methodology used in the BRMP to assess the recommended management options.
http://www.toronto.ca/legdocs/2005/minutes/committees/wks/wks050308.pdf

At its meeting on July 15, 16 and 17, 2008, City Council approved The Terms of Reference to update and finalize the Biosolids Master Plan (BMP) taking into account the findings of the Peer Review Report.

http://www.toronto.ca/legdocs/mmis/2008/pw/reports/2008-06-27-pw17-cr.pdf

At its meeting on November 30, December 1, 2, 4 and 7, 2009, City Council approved the Biosolids Master Plan for Ashbridges Bay, Humber and North Toronto Treatment Plants and requested staff report back to Public Works and Infrastructure Committee on the feasibility of accelerating the preferred biosolids management strategy for Highland Creek Treatment Plant (HCTP). Staff were also asked to report back on the options and costs of achieving higher emissions control standards than those assumed in the BMP and required by regulation.
http://www.toronto.ca/legdocs/mmis/2009/cc/decisions/2009-11-30-cc42-dd.htm

At its meeting on January 5, 2010, Public Works and Infrastructure Committee requested staff consider and report back on the feasibility of biosolids truck haulage using a future shoreline road as well as the construction of facilities that would be required for transportation of biosolids by rail.
http://www.toronto.ca/legdocs/mmis/2010/pw/decisions/2010-01-05-pw29-dd.htm

At its meeting on June 8 and 9, 2010, City Council directed staff to implement a Beneficial Use biosolids management strategy for HCTP with Landfilling as a contingency option. Council also directed a specific haul route and asked that the General Manager report back on the potential use of enclosed van dumpsters or tanker trailers.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2010.PW33.4

At its meeting on March 23, 2011, Public Works and Infrastructure Committee requested that staff report back on a number of issues including the logistical issues of pursuing beneficial use at HCTP, feasibility of the selected haul route, area impacted by air contaminants, trucking options, cost comparison and environmental impacts between land application and Fluidized Bed incineration and legal issues with respect to the BMP under the Provincial Environmental Assessment Act. Committee also requested the Medical Officer of Health to report to the Public Works and Infrastructure Committee on the potential health impacts of the available biosolids management options
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.PW2.9

At its May 17, 18 and 19, 2011 meeting City Council considered a report from the General Manager of Toronto Water recommending City Council approve the recommendations contained in the Biosolids Master Plan, specifically, the replacement of existing Multiple Hearth incinerators at HCTP with new modern Fluidized Bed incinerators with state of the art scrubbing technology. City Council instead directed staff to implement Beneficial Use as the primary biosolids management strategy and Landfill Disposal as a contingency option for the HCTP.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.PW3.4

At its November 14, 2012 meeting, Public Works and Infrastructure Committee received for information a report detailing staffs' discussion with the MOE regarding City Council's May 2011 direction to staff and staff's intent to move forward with a

Schedule B Class Environmental Assessment for HCTP as a result of these discussions.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2012.PW19.12

ISSUE BACKGROUND

In the fall of 2002, the City of Toronto initiated a Biosolids and Residuals Master Plan (BRMP – later referred to as the Biosolids Master Plan – BMP) that was to provide direction on the future management of biosolids generated by the City's wastewater treatment plants to the year 2025. The BMP was undertaken in accordance with the Municipal Engineers Association Class Environmental Assessment (Class EA) process as defined in the Environmental Assessment Act.

Current Biosolids Management at Highland Creek TP
Currently, biosolids generated at the HCTP are managed using two Multiple Hearth incinerators constructed in the early 1970s. During the preparation of the BMP, the existing HCTP incinerators were found to be in urgent need of repair. During this same time, the MOE issued an order requiring the City to expeditiously undertake certain repairs. To ensure the continued and safe operation of the aging infrastructure and to meet the requirements of the MOE order, staff developed and commenced implementation of certain repairs. Implementation of these works began in 2007 and remains ongoing. When completed these repairs are intended to extend the service life of the facility approximately 10 years and ensure safe and reliable operation while the construction of any new facilities are completed.

Peer Review and Biosolids Master Plan
In 2005, Works Committee requested that the General Manager of Toronto Water, together with the Medical Officer of Health, undertake a peer review of the decision making model and methodology used to assess the various biosolids management options in the BMP.

In 2007, the Peer Review Panel concluded that the decision-making model used in the draft BMP was a reasonable model that is commonly used in Master Plans and Environmental Assessments. The report recommended some improvements that could be made to the decision making model in order to provide more clarity to the Master Plan.

In 2008, Council approved a Terms of Reference to update the BMP taking into account the comments and recommendations of the Peer Review Panel. The City's consultant completed the work outlined in this Terms of Reference as part of the original BMP project.

In October 2009, the BMP update was completed, taking into account the Peer Review findings, and released for 30 day public review to fulfill the requirements of the Class Environmental Assessment Master Planning Process. The preferred option recommended by the BMP for the HCTP was to replace the existing 35 year old incinerators with state of the art Fluidized Bed Technology. This option scored the

highest using the methodology developed during the public consultation process and modified though the Council directed peer review process.

In December 2009, the BMP was brought forth to City Council for approval. Council approved the BMP recommendations and strategies for three of the City's four wastewater treatment plants but not the recommendations related to the HCTP. Council directed staff to undertake additional analysis of the thermal and beneficial use options.

In May of 2011, after receiving the additional technical information including a confidential attachment, Council directed staff to implement a beneficial use program with a truck loading facility at HCTP using landfill as a contingency option.

Subsequent to Council's consideration of the BMP in May 2011, an additional public meeting was held in the Highland Creek community and several local community members expressed concerns to the City and the Ministry of the Environment (MOE) with Council's final decision. Completion of the BMP was delayed as staff attempted to draft a summary document outlining the additional technical information gathered since the BMP was completed including the materials presented to City council in May 2011 and the information presented to the public in October 2011.

Staff were unable to prepare a summary document that would trace in a logical manner the conclusions reached in the updated BMP (which was prepared using the 2008 Council approved Terms of Reference) and the final Council direction provided in May 2011.

COMMENTS

Biosolids Truck Loading and Odour Control Conceptual Design Report

In March 2012, staff released a Request for Proposal (RFP) to retain Consulting services to prepare a conceptual design for the Council directed biosolids truck loading facility and associated odour control facility at Highland Creek Treatment Plant (HCTP). The scope of services included an investigation of the current digester capacity and enhancements needed to ensure biosolids generated from HCTP meet regulatory standards for agricultural land application, as well as the development of a design plan and the associated estimated costs of the proposed works.

The final Conceptual Design Report (CDR) was completed in May 2013. A copy of the Executive Summary is attached as Attachment 1 to this report. A copy of the report in its entirety can be found at:
http://www.toronto.ca/wes/techservices/involved/wws/highnlc/pdf/hctp-biosolidstruckloadfacility-cdr.pdf

The CDR details how a standalone biosolids truck loading facility can be constructed with two truck loading bays and 5.5 days storage. The proposed location for the facility is in the area of the current ash lagoons. An odour control facility would be required to treat air collected from the truck loading facility before it is released back to the environment. Finally, one new digester accompanied by a primary sludge

thickening system would be required immediately to ensure compliance with regulations for land application and a second unit would be required by 2032.

The capital cost to construct these facilities to support a biosolids beneficial use program for HCTP is estimated to be $150,302,000 exclusive of HST. This does not include the cost of refurbishing the existing digester gas systems as this cost ($11.5 million) is already included in Toronto Water's 2013 Capital Plan and planning for the required work is under way. The breakdown of costs is summarized in Table 1 below.

TABLE 1 - Summary of Truck Loading Facility and Digester Upgrade Capital Costs[1]

	Costs
Truck Loading Facility	$ 95,714,000
Digester Upgrades[2]	50,585,000
Waste Gas Burner Upgrades	3,905,000
Total (excluding HST)	**$ 150,302,000**

Notes:

1. Costs noted in this table include direct and indirect costs, contingencies, escalation to midpoint in construction (assumed to be 2016) and engineering. Exclusive of HST.
2. The cost of the Digester Upgrades is based on one new digester by 2016 and one additional new digester by 2032

Incinerator Works Undertaken and Under Way to Ensure Extended Operability and Reliability

During the latter stages of the BMP, the existing 1972 incinerators were found to be in an advanced state of disrepair. As such, certain upgrades to the incineration facility were urgently needed to ensure a sufficient level of reliability and to remain operational until the existing incinerators could be abandoned and replaced with new infrastructure. For planning purposes, a ten year time horizon was selected as this was deemed a conservative estimate of the time required to complete the necessary capital works prior to decommissioning the existing multiple hearth incinerators. As such, all repairs completed and under way are intended to extend the useful life of the facility by this period.

At the same time, the MOE inspected the facility and issued orders requiring the city to repair all emissions leaks in the emergency by-pass stacks. Although the amount of leakage is small, this issue is of great concern to the local community as the leak is considered an emission "spill" that is out of compliance with the plant's Certificate of Approval (now referred as the "Environmental Compliance Approval"). The MOE mandated repairs to the by-pass stacks are underway and scheduled to be complete in October 2013.

A minor repair of incinerator No. 1 was completed in 2010 and design works associated with repair of incinerator No. 2 is 95% complete. This work was tendered in July 2013 and is expected to be complete by the end of 2013. In the interim, plant staff continue to keep the incinerators operational despite numerous mechanical

challenges associated with the age of the infrastructure. There is no alternate means of biosolids disposal at the Highland Creek facility at this time and as such continuous operation is critical.

MOE Discussions

Staff met with the MOE twice during the summer of 2012 to discuss the implementation of the Council directed solution for the HCTP truck loading facility and the final acceptance of the BMP as the EA approval vehicle to move forward with seeking further environmental approvals to implement Council's May 2011 direction.

The Environmental Assessment Act allows any person to make a request to the Ontario Minister of the Environment for an individual EA. This is known as a Part II Order Request.

Acknowledgement by the MOE that the BMP fully documents a traceable and transparent process by which the recommended solutions have been arrived at is critical in order for the City to mitigate the risk of Part II Orders and MOE conditions related to implementation. Staff were concerned with potential implementation delays given the anticipation of Part II Order requests resulting from local concerns with truck haulage of biosolids through the neighbourhood.

The Class EA process requires the City to consider all comments received from the public and review agencies and consider proposed mitigation measures during the planning process.

After consulting with the MOE in 2012, it was clear to staff that the BMP could not be relied upon to seek the further environmental approvals required to implement Council's May 2011 direction. During those consultations with the MOE, it was determined that a separate process consistent with Class EA requirements should be undertaken just for the HCTP in the following manner:

- Prepare a summary document to the BMP outlining the additional technical information gathered since the BMP was completed including the materials presented to City council in May 2011 and the information presented to the public at the October 2011 Public Meeting. The BMP would be considered closed as the BMP would not be used to secure any MOE approvals required to proceed with project undertakings at the HCTP.

- Undertake a separate Schedule B Class Environmental Assessment specifically for the implementation of the proposed HCTP biosolids management undertakings. This process would require an assessment of the potential environmental effects of all viable biosolids management options (including the "Do Nothing" option), proposed mitigation measures and consultation with the public, agencies and all other identified stakeholders before selecting a preferred solution.

The viable biosolids management options that would be examined by the separate Schedule B Class EA would include, at a minimum, the following:

- **biosolids beneficial cake management through:**
    - agricultural land application
    - land rehabilitation
    - silviculture
    - pelletization
    - composting
    - alkaline stabilization
    - vermiculture
    - Lystek process
    - co-management with solid waste

- **biosolids cake management through thermal reduction technologies with and without energy recovery including:**
    - Incineration (fluidized bed and multiple hearth)
    - Pyrolysis
    - plasma assisted oxidation
    - gasification

- **biosolids cake management through disposal:**
    - municipal landfill
    - landfill cover
    - monofill (dedicated biosolids landfill)

- **biosolids cake management though feed to an industrial process:**
    - fertilizer blending and manufacturing
    - feed to cement manufacturing
    - feed to fuel production

HCTP Schedule B Biosolids Management Class EA Request for Proposal

Staff have prepared a Request for Proposal (RFP) to retain Consulting services to undertake the additional biosolids Class EA work for the HCTP. The City Project Team for this Class EA includes staff from Toronto Public Health (TPH) and the Toronto Energy and Environment Office (EEO) in addition to Toronto Water. Both TPH and EEO assisted in the preparation of the RFP.

A copy of the Scope of Work for the assignment is attached as Attachment 2.

The Schedule B Class EA will look at all viable biosolids management options and will include a Health Impact Assessment (HIA) that will be overseen by TPH as well as a Cumulative Impact Assessment (CIA) that will be overseen by the EEO. TPH will use their HIA framework developed for them by an outside consultant. EEO will provide the use of their in-house developed air emissions model that has been used extensively to assess emissions impacts throughout the City. The results of the CIA and HIA will be used by the third party consultant to assess all biosolids management options and arrive at a preferred biosolids management strategy for the HCTP.

Throughout the process, consultation with stakeholders including the public and specifically the surrounding community will be undertaken. An update of the EA

process and a summary of the Scope of Work were presented to the HCTP Neighbourhood Liaison Committee on May 13, 2013.

Once the consultant is retained, the Class EA should take approximately twelve months to complete and may cost in excess of $500,000 depending on stakeholder input and consultation. Costs could rise if increased public consultation becomes necessary. This estimate does not include the cost of defending against Part II order requests should they arise.

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ATTACHMENTS

1. Executive Summary of HCTP Biosolids Truck Loading Facility Conceptual Design Report
2. Scope of Work for Highland Creek Wastewater Treatment Plant Biosolids Management Schedule B Environmental Assessment