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Item No. 4

Halifax Regional Council
June 2, 2009

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY: Brad Anguish, Director of Business Planning, Information Management & Halifax Harbour Solutions Project

DATE: May 22, 2009

SUBJECT: **Harbour Solutions Project - 4th Quarter Report**
January to March 2009

INFORMATION REPORT

ORIGIN

This report originates from the Council session of October 22, 2002 when staff was authorized to submit quarterly reports for the duration of the project.

BACKGROUND

HRM has entered into five contracts to date for the implementation of the Halifax Harbour Solutions Project, namely:

- an infrastructure development agreement for the construction of the three Wastewater Collection Systems on October 15, 2003 with Dexter Construction; and
- a development agreement for the construction of three advanced primary Wastewater Treatment Facilities on June 15, 2004 with D&D Water Solutions, Inc.; and
- a development agreement for the construction of a Biosolids Processing Facility on November 30, 2004 with SGE Acres Limited, and
- an operating and maintenance agreement for the Biosolids Processing Facility on November 30, 2004, with N-Viro Systems Canada Inc.; and
- an operating agreement for the transportation of dewatered biosolids from the three new

Wastewater Treatment Facilities on May 31, 2006, with Seaboard Liquid Carriers Limited.

DISCUSSION

It must be noted that this is a historical report of quarterly project activities up until March 31, 2009. Staff provided a public project update briefing for Council and media outlets on April 14, 2009, therefore there are no new updates contained in this report. Staff are aiming to conduct the next public update in late June. Investigative and restoration work continue to progress at the Halifax Wastewater Treatment Facility.

As at the end of the 4th quarter 2009/09, the completion of the Wastewater Treatment Facilities (WWTF), Wastewater Collection Systems (WWCS) and Biosolids Processing Facility is progressing within budget; however, the financial implications of the wastewater flooding incident at the Halifax WWTF on January 14th, 2009 are not yet determined.

Halifax

Substantial Completion was achieved on December 19, 2008 for both the Halifax Wastewater Treatment Facility and Collection System with the exception of Pier A Pumping Station and all (CSO) chambers, excluding the Balmoral CSO chamber. These exceptions remain the responsibility of the Contractor until satisfactory substantial performance can be proven. Investigative work is ongoing.

The Halifax Wastewater Collection System work during the 4th quarter of 2008/09 focused on the rectification of minor deficiencies and application of the Substantial Completion process for those components that have not yet achieved Substantial Completion.

A significant wastewater flooding incident occurred at the Halifax WWTF on January 14th, 2009. As a result of this incident, the plant was not operational for most of the 4th quarter and remain shut down. During the quarter, work concentrated on clean-up from the flooding incident and progressing investigations to determine the cause of the flooding. Contractual deficiency repairs (identified through substantial completion process) were advanced in the accessible areas of the plant.

Beginning on January 14th, 2009, all wastewater formerly treated at the Halifax WWTF was diverted to Halifax Harbour through the eight combined sewer overflow chambers (CSOs) in the collection system. Information reports were submitted to Council on January 20, 2009, February 24, 2009, and April 14, 2009 regarding this matter. At the April 14, 2009 public briefing, staff provided a rough order of magnitude estimate of one year to fully restore and re-commission the Halifax WWTF.

Dartmouth

The Dartmouth WWCS has been commissioning and treating sewage since July 2008 and work during the

4th quarter of 2008/09 focused on addressing minor system deficiencies. Documentation for Substantial Completion for Dartmouth was also initiated.

Work at the Dartmouth WWTF focused on implementing improvements that will enable the plant to meet the project specifications for odour and effluent quality, prior to achieving substantial completion. Adjustments were made to the Densadegs (treatment tanks) to improve their performance under conditions where wastewater flows have low solids content. Experiments to improve the effectiveness of the coagulant dosing process were also initiated during the quarter. (Coagulants are additives used to assist in the separation of suspended solids in wastewater).

Herring Cove

The Herring Cove WWCS work during the 4th quarter of 2008/09 continued to focus on completing the Roaches Pond retention tank and the Herring Cove Pumping Station.

Regarding the WWTF, structural and architectural work was substantially completed during the 4th quarter of 2008/09. Coating of water bearing structures, painting and finish work, mechanical work, piping and cabling were all substantially completed during the quarter.

Wastewater introduction to the Herring Cove WWTF is currently forecasted to occur in the second quarter of 2009/10.

Biosolids Processing Facility

During the 4th quarter of 2008/09, the Biosolids Processing Facility (BPF) continued to process biosolids from the Aerotech Dewatering Facility, the Dartmouth WWTF and until January 14th, from the Halifax WWTF. (No biosolids were generated at the Halifax WWTF after January 14th , 2009, as a result of the flooding incident discussed above). The finished product continues to meet the class 'A' (biosolids standard for the Province of Nova Scotia) with some product meeting the exceptional quality standard. Consumer demand for the finished product remains high. Minor defect rectifications continued throughout the quarter.

Safety

There were no lost time incidents during this quarter.

BUDGET IMPLICATIONS

The Harbour Solutions Project spent $0.81 million in the 4th quarter of 2008/09 and, since the start of the

project, $307.03 million to March 31, 2009. Quarterly expenditures are lower than usual due to the withholding of payments to D&D while issues are being sorted out regarding the cause of flooding of the Halifax WWTF. While projections to meet the capital budget of $332.7 million are still on target, the costs that will be incurred for cleanup, repair and restoration of the Halifax WWTF are still unknown at this time and are the subject of ongoing discussions with the Project's Insurers and Contractor.

As all completion dates certain for the various components have now passed, there should be no additional inflation risk to the Project. History of the Halifax Non-Residential Construction Index over the past twenty years shows average annual inflation of just over 2%. At the beginning of the project, staff conservatively estimated annual inflation at 2.8% for budget purposes. However, fiscal years 2004/05, 2005/06, 2006/07, and 2007/08 brought inflation of 7.87%, 4.31%, 5.25%, and 7.78% respectively. In the first quarter of 2008/09, inflation was 6.24%. To mitigate this risk and financial impact, staff revised the inflation estimate to approximately 6% per year over the life of the contract and a substantial portion ($14.7 million) of the $18.2 million contingency was committed to address this issue.

As all of the dates certain for completion of the various components have now passed, staff has estimated the actual total inflation to the end of the project to be $24.1 million, based on the inflation rates experienced and the invoices received to date. As the original inflation budget at 2.8% was $12.3 million, the remainder of $11.8 million has been allocated from the contingency budget. The uncommitted contingency balance stands at $3.56 million as of March 31, 2009.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.

ATTACHMENTS

Appendix 'A' - Halifax Harbour Solutions Project Fourth Quarter Report - January to March 2009

A copy of this report can be obtained online at http://www.halifax.ca/council/agendasc/cagenda.html then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by : Craig Campbell, P. Eng., Acting Project Manager, Halifax Harbour Solutions Project

Report Approved by:	Brad Anguish, P. Eng., Director of Business Planning, Information Management & Halifax Harbour Solutions Project

Council Report Sign-Off Sheet

Subject: Harbour Solutions Project - 4th Quarter Report - January to March 2009

Meeting Date: **June 2, 2009** **9** Regular Council **9** In Camera **U** **Information Report**
9 Community Council **9** Board/Committee

Prepared by: **Ted Tam, P. Eng., Project Manager**
Halifax Harbour Solutions Project
Date: May 26, 2009

/	Stakeholder - Internal	Reviewed By	Date/Time	Time Spent on Report	Initial/ Signature
	Not Required (unique to originating BU)				
/	BPIM	Brad Anguish, Director, Harbour Solutions Project			
/	Acting Project Manager, HSP	Craig Campbell, P. Eng.	May 22/09		
/	Finance - FinTrack	Fintrack			
/	- Accounts - Financial Consultants - Procurement - Manager	Marlies van der Horst, Financial Consultant	May 22/09		
/	Corporate Communications	James Campbell, Communications & Public Relations Coordinator	May 11/09		
	Legal - By-Laws - Admin Orders - Other				
	Police				
	TAW				
/	Halifax Water	Dr. Tony Blouin, Compliance Coordinator	May 8/09		
/	Halifax Water	John Sibbald, Pollution Prevention Coordinator	May 14/09		
	Councillor(s)				
	Stakeholder - External				

Appendix A

Halifax Harbour Solutions Project
Fourth Quarter Report - January to March 2009

Introduction

The intent of this document is to provide Council and staff with a general overview of the Harbour Solutions Project progress during the period between January 1 to March 31, 2009.

It is presented in sections:

Section 1 - Wastewater Collection System (WWCS)

Section 2 - Wastewater Treatment Facilities (WWTF)

Section 3 - Biosolids Processing Facility (BPF)

Section 4 - Pollution Prevention Program

Section 5 - Water Quality Sampling Program

Section 6 - Financial Information

Section 7 - Public Involvement and Information Program

Section 8 - Construction Safety

Section 1

Wastewater Collection Systems

Halifax Wastewater Collection System

Substantial Completion was achieved on December 19, 2008 on the Halifax WWCS with the exception of Pier A Pumping Station and all Combined Sewer Overflow (CSO) chambers (excluding the Balmoral CSO chamber).

The Halifax Wastewater Collection System work during the 4th quarter of 2008/09 focused on the rectification of minor deficiencies and application of Substantial Completion process for those components that have not yet achieved Substantial Completion.

Dartmouth Wastewater Collection System

The Dartmouth WWCS work during the 4th quarter of 2008/09 focused on addressing deficiencies. Documentation for Substantial Completion for Dartmouth was also initiated.

Herring Cove Wastewater Collection System

The Herring Cove WWCS work during the 4th quarter of 2008/09 continued to focus on completing the Roaches Pond retention tank and the Herring Cove Pumping Station.

Section 2

Halifax Wastewater Treatment Facility

A significant wastewater flooding incident occurred at the Halifax WWTF on January 14th, 2009. As a result of this incident, the plant was not operational for most of the quarter. During the 4th quarter, work concentrated on clean-up from the flooding incident and progressing investigations to determine the cause of the flooding. Contractual deficiency repairs (identified through substantial completion process) were advanced in the accessible areas of the plant.

Dartmouth Wastewater Treatment Facility

Work at the Dartmouth WWTF focused on implementing improvements that will enable the plant to meet the project specifications for odour and effluent quality, prior to achieving substantial completion. Adjustments were made to the Densadegs (treatment tanks) to improve their performance under conditions where wastewater flows have low solids content. Experiments to improve the effectiveness of the coagulant dosing process were also initiated during the quarter.

Herring Cove Wastewater Treatment Facility

Structural and architectural work at the Herring Cove WWTF was substantially completed during the 4th quarter of 2008/09. Coating of water bearing structures, painting and finish work, mechanical work, piping and cabling were all substantially completed during the quarter.
Wastewater introduction to the Herring Cove WWTF is currently forecasted to occur in the second quarter of 2009/10.

Section 3

Biosolids Processing Facility

During the 4th quarter of 2008/09, the Biosolids Processing Facility (BPF) continued to process biosolids from the Aerotech Dewatering Facility, the Dartmouth WWTF and until January 14th, from the Halifax WWTF. (No biosolids were generated at the Halifax WWTF after January 14th , 2009, as a result of the flooding incident discussed above.) The finished product continues to meet the class A biosolids standard for the Province of Nova Scotia with some product meeting the exceptional quality standard. Minor defect rectifications continued throughout the quarter.

Section 4

Pollution Prevention Program

In support of the Harbour Solutions Project and as a requirement of Provincial legislation, HRM initiated a Source Control Strategy, now referred to as the Pollution Prevention (P2) Program. This program has been designed and implemented to reduce the levels of organic and inorganic compounds, toxins and other matter currently entering the municipal stormwater and wastewater sewer systems, and ultimately, freshwater and marine environments including Halifax Harbour.

The P2 program requires compliance with Halifax Water's Rules and Regulations through planning, education, inspections and monitoring at the source of these discharges from all industrial, commercial and institutional locations within HRM. Additionally, educational information is provided through various mediums for the residential sector to allow direct participation by the public in the protection of our natural marine and freshwater resources.

Staff previously provided updates to Council on the status of this program. Since the last update provided to Regional Council, activities that P2 staff have undertaken or completed include the following:

- Staff continued with inspections of businesses within the Dartmouth WWTF sewershed for compliance with Halifax Water's Rules and Regulations. Inspections within this sewershed are nearing completion.

- Particular emphasis has been directed to identify the source of observed elevated pH values and conductivity levels of the influent wastewater at the Dartmouth WWTF.

- A systematic approach was developed that started at the Dartmouth WWTF and tracked conductivity and

chloride concentrations through the Dartmouth collection system to identify possible sources.

- Field measurements of conductivity were performed to use as a surrogate measurement of chloride concentrations in the raw wastewater. Chlorides were also measured by taking grab samples at representative locations and used in establishing a correlation with conductivity measurements.

- Sampling has been performed several times at night, between midnight and 6 am when domestic flow from residential sources would be at a minimum and during periods of high tide. Sampling was also conducted during the day to identify any possible industrial or commercial source of elevated chlorides. Observed sources of sea water intrusion were identified and provided by P2 staff to the contractor and repairs were reported to be completed. These activities are currently believed to have corrected the frequent measurement of elevated chloride and conductivity. Only one event has occurred during the month of March in which suspected sea water inflow may have occurred during high tide and during a period where wave height and wind direction over the Halifax Harbour may have contributed to an inflow event. No additional events have been observed.

- Sea water intrusion to the collection system adds to the total volume of wastewater entering into the wastewater collection system, adds to the total volume required to be pumped by pumping stations and adds to the total volume of wastewater entering into the WWTF for treatment. Additionally, seawater intrusion may increase corrosion and affect wastewater treatment efficiencies. On-going monitoring will be maintained for the foreseeable future to insure no additional events of seawater intrusion.

- Elevated pH levels in raw sewage in varying frequencies have also been experienced by staff at the Dartmouth WWTF. P2 staff are monitoring manhole to manhole in the Dartmouth collection system and have deployed continuous recording pH metres to assist in locating any industrial source of pH. To date, three businesses have been identified that have had periodic elevated pH discharges. Two have altered their process and one has installed permanent pH neutralization equipment to meet Halifax Water's Rules and Regulations. No additional locations have been detected and at the time of this report, no pH spikes have been reported for the past two months. Staff will continue to monitor to identify and correct any new or recurring source of elevated pH discharges.

- Elevated chloride and conductivity levels believed to be a result of seawater inflow have also been observed in the Halifax WWTF sewershed. Staff have inspected and confirmed that components of the Harbour Solutions project such as CSO locations are not significant sources of sea water inflow.

- Currently, staff suspect as yet, unidentified direct connections such as old outfalls connected to the sanitary system, private property foundation or sump discharges to the sanitary system or sections of our existing collection system to be subject to tidal influence. Investigations to identify possible sources of salt water intrusion to the Halifax WWTF collection system are ongoing.

Section 5

Water Quality Sampling Program

The Harbour water quality monitoring program was initiated in June, 2004. Samples are collected at 35 stations in the harbour, from the head of Bedford Basin to the harbour mouth past McNabs Island. Stations are located down the centre of the harbour, and at various additional points including areas of recreational use such as the yacht clubs. Since 2006, additional samples have been taken in Dartmouth Cove, Fairview Cove, and new sampling sites were established at Herring Cove. Additional sampling was performed at Fairview Cove during 2007 to monitor for effects of sewage diversion due to construction at the Duffus Street pumping station. Sites have been added in late 2007/2008 around the NW Arm to monitor for changes as the Halifax plant comes online.

Regular sampling continues on a bi-weekly basis for bacteria, metals, nutrients and water chemistry. Samples are collected at the surface and 10 metres at each site. The data are compiled into bi-weekly and quarterly summary reports. Testing for oils and biochemical oxygen demand (a measure of organic constituents in the water) has been discontinued at regular sampling sites due to levels which are routinely below detection limits. Methods for more sensitive detection of metals have been instituted. The program remains on schedule and below budget.

The purpose of the program is to establish existing baseline water quality conditions in the harbour, and to track changes as each of the three new treatment plants is commissioned. The sampling program is scheduled to continue under the present contract until June 2009. Based upon oceanographic modelling of the harbour, it was predicted that the water quality objectives set by HRM, adapted from the Halifax Harbour Task Force, would be met through the advanced primary sewage treatment provided for Halifax and Dartmouth.

Water quality objectives differ for different parts of the harbour, but for the Outer Harbour, Northwest Arm and Bedford Basin, it was predicted that guidelines for contact recreation would be met. With full commissioning of the Halifax plant in 2008, conditions in the Northwest Arm and Point Pleasant Park areas rapidly improved. Beaches were opened at Black Rock and the Dingle for the month of August 2008. Contact recreation guidelines were met, the only exceptions being the few days during or immediately following heavy rainfall events, when designed wet weather overflows occur at some points in the collection system.

With the January 2009 shutdown of the Halifax treatment plant, bacteria levels again now exceed the swimming guidelines for many areas of the harbour. It will not be possible to re-open the harbour beaches until the Halifax plant is re-commissioned.

Quarterly reports and weekly/bi-weekly data reports and spreadsheets are available online at:
http://www.halifax.ca/harboursol/waterqualitydata.html

Section 6

Financial Information

As of March 2009, the Harbour Solutions Project has spent $307.03 million of its $332.7 million capital budget. Spending for the 4th quarter of 2008/09 just completed was $0.81 million, of which $0.04 million was spent on the biosolids processing facility. Contract management, the Public Involvement & Information Program, pollution prevention, water quality monitoring, community liaison committees and administration totalled $0.77 million.

Inflation

Over the life of the project, 2004/05 was an extraordinary year for construction-related inflation in HRM in terms of its strong increase. In 2005/06 the inflation trend stabilized somewhat, and was lower than the revised inflation projection of 6% (4.31% vs. 7.87% in 2004/05). Inflation for fiscal years 2006/07 and 2007/08 was 5.25%, and 7.78% respectively, while the first quarter of 2008/09 saw inflation of 6.24%.
As of June 2008, $11.82 million over and above budgeted inflation of $12.3 million has been spent on the sewage collection system and the sewage treatment plants. As the completion dates for all components have passed, there should be no further inflation incurred.

Contingency Spending

The contingency budget of $18.20 million is largely set aside for addressing inflation beyond budgeted levels. The contingency is also being used to fund small items that have arisen through the contract amendments. At this point, the contingency balance needs to be allocated to cover costs associated with the cleanup and repair and restoration of the Halifax WWTF - at the very least until these costs can be recovered through insurance or contractual obligations.

Actual and planned spending of contingency funds is as follows (shown in millions).

Realized inflation in excess of budget	$11.82
Amount committed for diffusers	2.50
net of CSIF contribution	(2.50)
Project amendment	0 .91
Herring Cove Water & Sewer	1.66
Commitments	0.25
Uncommitted	3.56
Total	$18.20

Commitments listed above include a larger Fournier press and a larger chemical tank storage.

At the time of writing this report, the financial impact of the flooding event and resultant temporary shut down at the Halifax WWTF is still unknown. Although the plant has extensive insurance coverage, HRM will incur the initial recovery costs up front and therefore will have to draw on the contingency balance until insurance details have been agreed upon. It should also be noted that there remain numerous potential

project risks that may require funding from the contingency balance, such as insurance deductible(s) and design changes due to changes in Building Code.