




Hamilton

INFORMATION UPDATE

TO: Mayor and Members City Council	WARD(S) AFFECTED: CITY WIDE
DATE: February 25, 2011	
SUBJECT: City of Hamilton Closed Landfills (City Wide)	
SUBMITTED BY: Gerry Davis, CMA General Manager Public Works Department	SIGNATURE: 

The General Issues Committee, at its meeting of February 14, 2011 GIC, requested additional information on the City's closed landfill sites as a result of the discussions around Item 8.1, City of Hamilton Policy for Hamilton Renewable Power Inc. (HRPI) Dividends (FCS11002). Staff were requested to provide additional information be provided in terms of a breakdown of individual amounts of liability on each of the landfill sites that comprises the approximate \$27 million in liability to date.

Under the standards of the Public Sector Accounting Board (PSAB), all governments are required to record and disclose information about solid waste landfill liabilities as required by Section 3270 of the Public Sector Accounting Handbook., attached as Appendix A to this update. The liability calculation is done on an annual basis by the Financial Services Division of the Corporate Services Department. Waste Management staff provides information on the estimates of future costs, landfill capacity, diversion rates, assumptions on Glanbrook closure date and activities at closed landfill sites. The calculation is prepared by Financial Services and has been developed over the course of many years and contains the following sections:

- Liability for existing closed landfill sites
- Liability for closure costs on open site
- Liability for the one time closure cost of the open site in 2036 (based on current landfill capacity estimates)
- Liability for post-closure care costs on Glanbrook (current open site) when closed in 2036
- Total landfill liability

The total landfill closure and post closure liability for 2009 was \$26,953,000 and is summarized in Table 1.

Table 1 - City of Hamilton Solid Waste Landfill Closure and post-closure Liability (CICA PS3270)

2009

Components of 2009 Landfill Liability				
Discount rate			5.00%	
A.	Liability for existing closed landfill sites			
	Discounted cash flows of future payments on post-closure costs in capital projects			A \$ 16,655,357.82
	Estimated costs from 2010 to 2027 (18 years)	\$ 23,048,554.20		
	Projects not completed in 2010 are expected to be completed in 2011 unless otherwise noted in 2010 capital budget			
B.i.	Liability for closure costs on open site			
	Discounted cash flows of future payments on closure costs in capital projects			B i \$ 15,763,084.92
	Estimated closure costs on phases of open site that have already closed	\$ 27,537,760.30		
	Estimated costs on phases of open site that will be eventually closed			
	Costs from 2010 to 2036 (27 years)			
B. ii.	Liability for the one time closure cost of the open site in 2036			
	Estimated one-time costs in 2036	\$ 7,649,335.00		
	Discount factor - calculated	5.00%	0.26784900	
	Discounted to 2009		\$ 2,048,866.73	
	Estimate one-time costs discounted to 2009			Bii \$ 2,048,866.73
B	Total (B.i. and B. ii.)			B \$ 17,811,951.65
	Capacity Used		43.66%	
	Liability			B \$ 7,776,103.19
C.	Liability for post-closure care costs on Glanbrook (current open site) when closed in 2036			
	Discounted cash flows of future payments			\$ 21,559,798.28
	Costs from 2037 to 2061 (25 years) discounted back to 2009			\$ 5,774,770.41
	Estimated costs	\$ 41,185,934.84		
	Capacity Used		43.66%	
				C \$ 2,521,071.89
D.	TOTAL LANDFILL LIABILITY - 2009			D \$ 26,952,532.90

The City's landfill liability costs have decreased as a result of the remediation efforts undertaken at the closed landfill sites and implementation of the Solid Waste Management Master Plan to extend the life of the Glanbrook Landfill site. In 2002 the City's estimated landfill liability costs were \$46.85 million but have been reduced to \$26.95 million in 2009. This demonstrates that the monitoring, maintenance and remediation work that is being done on the City's closed landfills is having a positive impact.

The City is responsible for monitoring, maintaining and completing remediation projects at twelve (12) closed landfills. Although the landfills have been closed the City, as the owner, still assumes liability for those landfills to ensure that they do not adversely impact the environment.

Through legislation, the Ontario Ministry of the Environment (MOE) requires that closed landfills have ongoing monitoring and maintenance as part of their closure plans. The MOE specifies that, for example, groundwater monitoring, preventative maintenance and final cover be maintained at closed landfills. Annual reports are submitted to the MOE on the status of the landfills and to demonstrate that MOE requirements have been fulfilled. Should legislated requirements not be met the MOE may lay charges against the City. In addition, by monitoring and maintaining the closed landfills, the City is able to detect and address any issues sooner, reduce potential remediation work, offset any liability since due diligence can be demonstrated, and mitigate any environmental impacts.

Maintenance and remediation of the City's closed landfills has been and continues to be funded out of the capital budget. Since 2001 a total of approximately \$40 million has been budgeted for maintaining and completing major remediation projects on the City's closed

landfills. Of this amount, \$13.38 million was funded by the Province of Ontario and the Federal Government through the Millennium Partnership Funding Program. Any work that was funded through the Millennium Partnership Fund was completed by March 2009 as required in the contract between the City and the Provincial/Federal government. A full listing of the environmental investigations and remedial work is provided in Appendix B.

Presently the Operations and Waste Management Division has three (3) Works In Progress (WIPs) capital budget accounts from previously approved capital with an available balance of \$3,220,000. The budgeted money in these WIPs is for maintenance and capital improvements. Annual closed landfill maintenance includes work such as removing monitoring wells, maintaining landfill cover and providing site security at all twelve (12) sites. Capital improvements fund larger scale projects such as landfill cap remediation, seep remediation, and the installation of landfill gas migration prevention and/or leachate collections systems. Larger scale projects will span several years and construction works are dependent on MOE approvals, which can delay completion of projects. From 2001 to the end of 2010 eighty-one percent of the closed landfills total budget has been spent.

For future work in 2011 and beyond, staff have developed a plan that includes seep remediation, monitoring well removal, landfill cover and well maintenance, leachate forcemain flushing and repair, and road and landfill cap repairs. This work will be funded out of the remaining 2008, 2010 and pending 2011 closed landfill budgets.

Presently staff is working with a consultant to determine potential remedial work to the east bank of the Chedoke creek, adjacent to the West Hamilton Landfill (Kay Drage Park). In 2007 remedial work was completed to the east bank of Chedoke Creek along the North portion of the creek from the Macklin Street Bridge to Cootes Paradise. The south portion of Chedoke creek is now being assessed for potential landfill leachate impacts from the Macklin Street Bridge south to Glen Road, which should be completed in 2011. Funds have been allocated in Project ID 5120792000 for any potential work required for the creek bank remediation, which may include creek bank stabilization and/or installation of a leachate collector. These actions would be initiated to prevent possible creek slope failure and/or contamination of the creek.

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Chris Murray, City Manager

Rose Caterini, City Clerk

Mary Gallagher, Manager, Legislative Services/Deputy Clerk

Rob Rossini, General Manager, Corporate Services

Kelly Anderson, Public Affairs Coordinator, Public Works

Andy Grozelle, Legislative Assistant, City Clerks

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Bryan Shynal, Director, Operations

Craig Murdoch, Director, Environmental Services

Pat Parker, Director, Support Services

Emil Prpic, Manager, Recycling and Waste Disposal

Brian McMullen, Manager, Accounting Services

SECTION PS 3270

solid waste landfill closure and post-closure liability

TABLE OF CONTENTS	Paragraph
Purpose and scope	.01-.03
Landfill operations	.04-.07
Definitions	.08-.11
Recognition and measurement	.12-.20
Disclosure	.21

PURPOSE AND SCOPE

- .01 This Section establishes standards on how to account for and report the liability for closure and post-closure care of a solid waste landfill site in government financial statements. Specifically, it:
- (a) defines which activities should be included in closure and post-closure care;
 - (b) establishes when to recognize and how to measure the closure and post-closure care liability; and
 - (c) provides the related financial statement presentation and disclosure requirements.
- .02 The Section applies to all operating and closed landfill sites of governments and their organizations.
- .03 This Section does not address accounting and reporting for:
- (a) opening expenditures, such as those associated with locating a site or constructing a leachate collection system;
 - (b) end-use expenditures, such as those that transform the site into park land, as they would be attributable to that end-use and not to the landfill; and
 - (c) unforeseen or catastrophic events, such as a major leachate collection system failure.

LANDFILL OPERATIONS

- .04 A solid waste landfill site is a defined area of land or excavation that receives waste that may include household waste, commercial solid waste, non-hazardous sludge, and industrial solid waste.
- .05 Government legislation and regulations set out a stringent environmental approval process for landfill sites. That process may establish:
- (a) how sites are selected and operated;
 - (b) when sites should be closed;
 - (c) for how long into the future the sites should be monitored to determine if environmental damage is being caused; and
 - (d) in some cases, that financial assets be available to satisfy the liability.

- .06 Generally, there is a landfill "footprint" that represents the impression of an entire landfill site and comprises the total expected capacity of the site. The footprint can be divided into individual "phases". Under the environmental approval process, the entire footprint may require approval or each phase may require separate approval. A phase may comprise a series of individual "cells", so that only a portion of each phase would be used at any one time.
- .07 A landfill operator must agree to certain obligations prior to receiving environmental approval and accepting any waste. Those obligations include responsibility for closure and post-closure care of the approved site.

DEFINITIONS

- .08 Certain activities relating to a site or phase are required before it opens, during its operating life and when it stops accepting waste. Only the expenditures relating to those activities required when the site or phase stops accepting waste are included in the closure and post-closure care liability.
- .09 **Closure activities** include all activities related to closing the landfill site. These may include:
- (a) final cover and vegetation; and
 - (b) completing facilities for:
 - (i) drainage control features;
 - (ii) leachate monitoring;
 - (iii) water quality monitoring; and
 - (iv) monitoring and recovery of gas.
- .10 **Post-closure care activities** include all activities related to monitoring the site once it can no longer accept waste. These may include:
- (a) acquisition of any additional land for buffer zones;
 - (b) treatment and monitoring of leachate;
 - (c) monitoring ground water and surface water;
 - (d) gas monitoring and recovery; and
 - (e) ongoing maintenance of various control systems, drainage systems, and final cover.
- .11 Some closure and post-closure care activities may not be listed above, or may not be applicable in every situation. Closure and post-closure care activities may differ depending on the method used for the landfill operations, the type of waste accepted, the environmental conditions within which the landfill is situated, and the environmental requirements needed to comply with regulations. Reference should be made to the environmental approval and legislative or contracted requirements when determining which activities to include in closure and post-closure care.

RECOGNITION AND MEASUREMENT

- .12 Under environmental law, there is a liability for closure and post-closure care. It is not sufficient to disclose the closure and post-closure care liability as a contingency or a contractual obligation as the existence of the liability is known with certainty.
- .13 *Financial statements should recognize a liability for closure and post-closure care as the landfill site's capacity is used. Usage should be measured on a volumetric basis (e.g., cubic metres). [FEB. 1998]*
- .14 The liability for closure and post-closure care begins when the site starts accepting waste. Normally, it would be recognized over the operations of the site, beginning when the site first accepts waste and be fully recognized when the site stops accepting waste. If the site is operated

on a phase basis, the closure and post-closure liability associated with that phase would be fully recognized when the phase stops accepting waste.

- .15 The change in the liability and the expense for the site or phase would be calculated as follows:

$$\begin{array}{rcl} \text{(Estimated total} & \times & \text{Cumulative capacity used} & - & \text{Expenditures} \\ \text{(expenditure} & & \text{Total estimated capacity)} & & \text{previously recognized} \end{array}$$

- .16 The estimated total expenditure represents the sum of the discounted future cash flows associated with closure and post-closure care activities. The government's average long-term borrowing rate, determined on a consistent basis, may be appropriate to use as the discount rate.
- .17 When determining the estimated total expenditure for closure and post-closure care, consideration needs to be given to current technology, the length of the post-closure care period, and the environmental regulations at the time the estimate is made.
- .18 The capacity used would be estimated based on a rational and systematic method and on the best available information. It is important that the basis for estimating the total capacity and the capacity used be applied consistently so that the liability and results are comparable over time. At least once every three years, an assessment of the need for a comprehensive review of capacity would be completed.
- .19 The reported liability may be affected by changes in the estimated total expenditure, capacity used or total capacity. Changes could result from new technology, the demand for landfill space, the settling of waste, inflation rates, interest rates, regulatory requirements, or amendments to the approved size of the site or phase. A change in the estimated total expenditure, capacity used or total capacity would be recognized in accordance with the recognition formula set out in paragraph PS 3270.15.
- .20 Closure and post-closure care disbursements would be deducted from the reported liability when they are made.

DISCLOSURE

- .21 *The notes to the financial statements should disclose:*

- (a) the nature and source of landfill closure and post-closure care requirements;*
(b) the basis of recognition and measurement of the liability for closure and post-closure care;
(c) the reported liability for closure and post-closure care at the balance sheet date, the estimated total expenditures for closure and post-closure care, and the amount remaining to be recognized;
(d) the remaining capacity of the site and the estimated remaining landfill life in years;
(e) how any requirements for closure and post-closure care financial assurance are being met, e.g., performance bonds;
(f) the amount of any assets designated for settling closure and post-closure care liabilities; and
(g) the estimated length of time needed for post-closure care. [FEB. 1998]

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APPENDIX "B"

**MILLENIUM PARTNERSHIP FUNDING CLOSED LANDFILL MAINTENANCE,
MONITORING AND REMEDIATION PROEJCTS**

Project Milestones (Tasks) & Timelines (Completion Dates):

LANDFILL NAME	WORK PEFORMED	LOCATION
87 Acre Park	2004 Imported soil delivered to site 2005 Grading, topsoil and hydroseeding 2006 Well installation & engineering cap and site maintenance 2008 General engineering and monitoring report 2009 General engineering and monitoring report	Stoney Creek
Ancaster	2004 Proceeding with leachate collector maintenance and metering 2004 Additional remedial work undetermined until real estate transaction information 2006 End use engineering services (soccer fields), Assimilative Capacity Study 2007 Cover remediation 2008 Pump station engineering and drawings, general engineering and reporting 2009 Assimilative capacity study 2009 Pump station upgrades 2009 General engineering and reporting 2010 Pump station upgrades electrical 2010 General engineering and reporting	Ancaster
Beverly	2004 Site Specific Risk Assessment 2004 Fencing complete 2006 Well decommissioning and engineering	Flamborough
Binbrook	2004 Site Specific Risk Assessment 2004 Fencing complete 2004 Remedial action pending SSRA 2008 General engineering and monitoring report	Binbrook
Brampton Landfill	2006 Pump station SCADA upgrade, general engineering 2007 General engineering 2008 General engineering and monitoring report 2009 Well decommissioning and replacement 2010 General engineering and monitoring report	East Hamilton
Dundas	2004 Gas migration study and 1st phase of gas venting remediation system complete 2004 Potential Phase II gas control based on Phase I results 2004 Site Specific Risk Assessment and Phase II ESA (East Landfill) 2004 Waste Delineation study 2004 Remedial Action pending SSRA 2006 Waste Delineation Study 2007 Site Specific Risk Assessment, Gas monitor upgrades 2008 Site Specific Risk Assessment Update	Dundas

LANDFILL NAME	WORK PERFORMED	LOCATION
Edgewood Landfill	2004 Site Specific Risk Assessment 2004 Remedial action pending SSRA 2006 Long Term Strategy Study 2008 General engineering and monitoring report 2011 Monitoring well decommissioning	Flamborough
Glanford Landfill	2004 Site Specific Risk Assessment 2004 Fencing complete 2004 Remedial action pending SSRA 2006 Well installation and engineering 2008 General engineering and monitoring report	
Rennie Landfill	2006 General engineering 2007 General engineering 2008 General engineering and monitoring report 2009 PCB storage site investigation 2009 Well decommissioning and replacement 2010 General engineering and monitoring report	East Hamilton
Stoney Creek Landfill	2004 Short term remediation/investigation starting work 2004 1st Stage remediation complete 2008 General engineering and monitor report	Stoney Creek
Upper Ottawa Landfill	2004 Gas assessment report complete 2004 Flare decommissioned 2004 Seep remediation complete 2004 Constructed wetlands on hold 2005 Well decommissioning 2005 Flow metering complete 2005 Clay barrier leachate wall complete 2006 Leachate collection system extension 2008 General engineering and monitoring report 2009 General engineering and reporting 2010 General engineering and reporting 2011 Monitoring well decommissioning	Hamilton
West Hamilton	2004 Remedial design plans complete. 2004 Approvals for forcemain/leachate collector installation. 2005 Potential construction of leachate collection / creek retaining wall 2006 Various engineering and reporting, site grading and cap repair 2007 Chedoke Creek erosion and slope stability improvements, storm sewer replacement, engineering and inspections, electrical system upgrades 2008 General engineering and inspections, monitoring reports 2009 General engineering and monitoring report 2010 General engineering and reporting	Hamilton