



**Municipality of Southwest
Middlesex
Limerick Road Landfill
Closure and Post-Closure
Care Liability Estimates**

December 23, 2008



**Municipality of Southwest
Middlesex
Limerick Road Landfill
Closure and Post-Closure
Care Liability Estimates**

December 23, 2008

The Municipality of Southwest Middlesex

08-1327

Submitted by

**Dillon Consulting
Limited**



December 23, 2008

Municipality of Southwest Middlesex
153 McKellar Street, Box 218
Glencoe, Ontario
N0L 1M0

Attention: Mr. Jaime Francisco
Public Works Manager

**Solid Waste Landfill Closure and Post-Closure Liability
Limerick Road Landfill (former Mosa Township)**

Dear Mr. Francisco:

We are pleased to provide our report estimating the costs associated with liabilities for closure and post-closure care of the operating Limerick Road Landfill (former Mosa Township). If there are any questions, please call the undersigned at 519-438-1288 ext. 1232.

Yours sincerely,

DILLON CONSULTING LIMITED

A handwritten signature in blue ink, appearing to read "Rob Kell".

Rob Kell, P.Eng., P.Geo.
Project Manager

RFK:cmf
Encl.

Our File: 08-1327

130
Dufferin Avenue
London, Ontario
Canada
N6A 5R2
Mail Box 426
London, Ontario
Canada
N6A 4W7
Telephone
(519) 438-6192
Fax
(519) 672-8209

**Dillon Consulting
Limited**

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
2.0 COLLECTION AND REVIEW OF RELEVANT INFORMATION	1
3.0 ESTIMATES OF CLOSURE AND POST-CLOSURE EXPENDITURES	2
4.0 CHANGE IN THE LIABILITY AND ANNUAL EXPENDITURES	2
5.0 ADDITIONAL INFORMATION	4

Figure 1 – Site Plan

Spreadsheets:

- Closure and Post-Closure Care Cost Estimates – Limerick Road
- Closure and Post-Closure Care Cost Estimates – Limerick Road Water Quality Monitoring

1.0 INTRODUCTION

The Municipality of Southwest Middlesex engaged Dillon Consulting Limited to undertake the estimation of costs associated with liabilities for closure and post-closure care associated with the solid waste landfill site located at 724 Limerick Road, Municipality of Southwest Middlesex, Ontario, Canada (The Site – see Figure 1). The landfill is currently active.

The liabilities must be determined annually, in accordance with new accounting standards set out by the Public Sector Accounting Board (PSAB).

The reporting period is up to December 31, 2008. The base year is 2009 (i.e., time zero for present value calculations is January 1, 2009). Although the current Certificate of Approval for the site does not require water quality monitoring, we have provided two spreadsheets: one without monitoring and one with water quality monitoring.

The major tasks undertaken were:

- Task 1 Collect and Review Relevant Information
- Task 2 Estimate Closure and Post-Closure Expenditures
- Task 3 Change in the Liability and Annual Expenditure
- Task 4 Additional Information Required

The following report has been structured according to these tasks.

2.0 COLLECTION AND REVIEW OF RELEVANT INFORMATION

Information was provided by the Municipality of Southwest Middlesex, reviewed, and used for estimating closure and post-closure care liability. The information is listed on the appended spreadsheets.

3.0 ESTIMATES OF CLOSURE AND POST-CLOSURE EXPENDITURES

Activities for closure and post-closure care were defined, consistent with the Public Sector Accounting Recommendations PS 3270 (February 1998). Relevant cost items under these activities were identified for each landfill, based on a review of the provided information, and future expenditures were estimated.

The estimates of closure and post-closure care expenditures for each site are presented on the appended spreadsheets. To facilitate future updates, the quantity and unit cost assumptions for each expenditure are provided, along with explanatory comments. All costs are presented in current dollars (2008).

The present values of the closure and post-closure care costs were calculated based on the expected year(s) of the expenditures and using a discount rate of 3.72%. This is based on the Province of Ontario's average long-term borrowing rate of 5.97% (supplied by the Ministry of Municipal Affairs and Housing) minus an inflation rate of 2.25% (10-year average of the Consumer Price Index from 1999 to 2008). Inflation has been accounted for in the discount rate because all costs, present and future, are expressed in current dollars (2008). Present value factors used in the calculations are shown for transparency. The sum of the discounted future closure and post-closure care costs is presented on the spreadsheets as the "Estimated Total Expenditure".

4.0 CHANGE IN THE LIABILITY AND ANNUAL EXPENDITURES

The change in liability associated with the "Estimated Total Expenditure" was determined by applying a capacity factor for the estimated fraction of the total landfill capacity used to date. Assumptions used to estimate the capacity factors are noted on the spreadsheets.

The formula, as presented on the spreadsheets, is as follows:

$$G = (A \times E) - F$$

Where: G is the Change in Liability

A is the Estimated Total Expenditure

E is the Capacity Factor (cumulative capacity used/ total estimated site capacity)

F is the Expenditures Previously Recognized

As the calculation of closure and post-closure care liability has been completed for the first time, there are no expenditures previously recognized (i.e., F equals zero). Therefore, the change in liability is the entire liability.

5.0 ADDITIONAL INFORMATION

For the notes to the municipality's financial statements, the following information is required:

1. *The nature and source of landfill closure and post-closure care requirements:*
 - Sources and assumptions are noted on the spreadsheets.

2. *The basis of recognition and measurement of the liability for closure and post-closure care:*
 - The method of determination of liability is presented on the spreadsheets.

3. *The remaining capacity of the landfill and the estimated remaining landfill life in years:*
 - The remaining capacity and the estimated remaining landfill life, including the basis for its determination, are noted on the spreadsheets at the bottom.

4. *How any requirements for closure and post-closure care financial assurance are being met, e.g., performance bonds:*
 - The Municipality should provide this information.

5. *The amount of any assets designated for settling closure and post-closure care liabilities:*
 - The Municipality should provide this information.

6. *The estimated length of time needed for post-closure care:*
 - For the sake of estimating post-closure care liability, a period of post-closure care of 25 years from the time of final cover application has been assumed. This is the minimum period for post-closure monitoring required by the Ministry of the Environment.



Source: County of Middlesex Website



Property Line



Fill Area



SITE PLAN

SOUTHWEST MIDDLESEX - LIMERICK ROAD LANDFILL

Figure 1

Limerick Road Landfill - Active Closure and Post-Closure Care Cost Estimates 2008									
Cost Item	Unit	Quantity	Unit Cost	Cost	Year	PV Factor Single Pymt	PV Cost	Comment (source)	
Closure Activities									
Final Cover and Vegetation	m ²	225	\$2.70	\$608	2024	0.5762		\$351,225 m ² cell area	
Grading of Waste Cell	m ²	225	\$2.093	\$471	2024	0.5762		\$1,210,600 mm thick general cover soil	
General Cover Soil Layer	m ²	41,000	\$4.70	\$192,700	2024	0.5762		\$11,415,150 mm thick soil to support vegetation, hydraulic seeding	
Vegetative Layer	m ²	41,000	\$4.90	\$200,900	2024	0.5762		\$116,156 dust control, silt fence, engineering	
Miscellaneous									
SUB-TOTAL				\$396,300	2024	0.5762		\$228,132	
Contingency (15%)									
				\$59,445				\$34,370	
				\$455,745				\$263,502	
TOTAL CLOSURE COSTS									
Cost Item	Unit	Quantity	Cost 2008\$ (Annual)	Year Starting	Year Ending	PV Factor Single Pymt	PV Factor Equal Pymts	PV Cost	Comment (source)
Post-Closure Care Activities									
Final Cover & Vegetation Inspection/ Maintenance		Allowance	\$2,000	2024	2049	0.5762	16,0649	\$15,511	grading/seeding of 1% of raised area per year (25000)
Roads Inspection/ Maintenance		Allowance	\$1,000	2024	2049	0.5762	16,0649	\$9,308	for repair with recycled asphalt
Fencing/ Gully Inspection/ Maintenance		Allowance	\$750	2024	2049	0.5762	16,0649	\$6,979	for replacement of 3% of lamn fence (total=880 m) per year.
TOTAL POST-CLOSURE COSTS			\$3,750 (annual)					\$34,896	
ESTIMATED TOTAL EXPENDITURE									
Land fill start date									
CAPACITY FACTOR									
EXPENDITURES PREVIOUSLY REALIZED									
CHANGE IN LIABILITY									
Notes:									
Discount Rate for determining PV Cost	3.72%								
Base Year	2009								
Expected Closure Year	2024								
Remaining Landfill Life in years	15								
Period of Post-Closure Care in years	25								
Expected Closure Year	2024								
Start Year	1972								
All costs include GST									
A. (Sum of the Discounted Future Closure and Post-Closure Care Costs) 1972 Jaime Francisco communication 0.71 E = (Base year- Start Date)/ (Expected Closure date - Start Date) \$0 F (not applicable) \$212,322 G = (A x E) - F									

Limerick Road Landfill - Active - With Water Quality Monitoring Allowance										
Closure and Post-Closure Care Cost Estimates										
2008										
Cost Item	Unit	Quantity	Unit Cost 2008\$	Cost	Year	PV Factor Single Pymt	PV Cost	Comment (source)	PV Factor Equal Pymts	PV Cost
Closure Activities										
Final Cover/Land Vegetation	m ²	225	\$2.70	\$608	2024	0.5782				
Grading of Waste Cell	m ²	225	\$9.30	\$2,093	2024	0.5782	\$351,225	\$351,225 m ² cell area		
General Cover Soil Layer	m ²	41,000	\$4.70	\$192,700	2024	0.5782	\$111,415	150 mm thick soil to support vegetation, hydraulic seeding		
Vegetative Layer	m ²	41,000	\$4.90	\$200,900	2023	0.5782	\$116,156	150 mm thick soil to support vegetation, hydraulic seeding		
Miscellaneous	m ²	1	\$40,000.0	\$40,000	2023	0.5782	\$23,127	haul contract for fence engineering		
Small Groundwater Monitoring wells							\$23,260			
SUB-TOTAL				\$436,300	2024	0.5782	\$252,260			
Contingency (15%)				\$65,445			\$37,809			
TOTAL CLOSURE COSTS				\$501,745			\$290,068			
Post-Closure Care Activities										
Final Cover & Vegetation Inspection/Maintenance	Allowance		\$2,000	\$2,000	2024	0.5782	\$1,159	grading/seeding of 1% of capped area per year (\$2000)		
Roads Inspection/Maintenance	Allowance		\$1,000	\$1,000	2024	0.5782	\$579	for repair with recycled asphalt		
Fencing/Gate Inspection/Maintenance	Allowance		\$750	\$750	2004	0.5782	\$6,979	for replacement of 5% of farm fence (total=880 m) per year		
Water Quality Monitoring	Allowance		\$20,000	\$20,000	2024	0.5782	\$186,114			
TOTAL POST-CLOSURE COSTS				\$23,750 (annual)			\$221,011			
ESTIMATED TOTAL EXPENDITURE										
Less fill start date										
CAPACITY FACTOR										
EXPENDITURES PREVIOUSLY REALIZED										
CHANGE IN LIABILITY										
Discount Rate for determining PV Cost	3.72%									
Base Year	2009									
Expected Closure Year	2024									
Remaining Landfill Life in years	15									
Period of Post-Closure Care in years	25									
Expected Closure Year	2024									
Start Year	1972									
All totals exclude GST										
Notes:										
Discount Rate for determining PV Cost										
(\$0.97% long-term borrowing rate supplied by Ministry of Municipal Affairs and Housing, minus 2.25% inflation rate from 10 yr. average Consumer Price Index 1999 - 2008)										
Base Year										
Expected Closure Year										
Remaining Landfill Life in years										
Period of Post-Closure Care in years										
Expected Closure Year										
Start Year										
All totals exclude GST										
$A = (\text{Sum of the Discounted Future Closure and Post-Closure Care Costs})$ $B = \text{James Finlayson communication}$ $C = \text{James Finlayson communication}$ $D = \text{James Finlayson communication}$ $E = (\text{Base year, Start Date}) / (\text{Expected Closure date} - \text{Start Date})$ $F = (\text{not applicable})$ $G = (A \times E) - F$										
$A = \$511,109$ $B = \$173$ $C = \$0$ $D = \$0$ $E = 0.71$ $F = \$0$ $G = \$363,674$										

