



PO Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 2

Halifax Regional Council
August 5, 2008

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY:

A handwritten signature in black ink, appearing to read "Mike Labrecque".

Mike Labrecque P.Eng, Director Transportation and Public Works

DATE: July 14, 2008

SUBJECT: **2008-09 Capital Project CWI00782 Construction of Cell 5 Otter Lake**

INFORMATION REPORT

ORIGIN

2008-09 Capital Budget, Transportation and Public Works - Solid Waste Resources

BACKGROUND

The July 1997 Contract with MIRROR Nova Scotia Limited, as approved by Regional Council, provides the basic elements for the operation of the waste processing and disposal facility at Otter Lake. This contract includes and provides for MIRROR NS Ltd. and Dexter and Dillon Consulting Engineering (MIRROR's engineers) to:

- design and construct each new cell (and cell closure); and
- provide for the maintenance, repair or replacement of stationary, fixed and mobile equipment at the facility.

Annually, staff identifies and incorporates all known capital projects for the coming year. Capital Project No. CWI00782 - Construction of Cell 5, is contained in the approved 2008-09 Capital Budget.

DISCUSSION

Capital Project CWI00782 - Construction of Cell 5:

Section 15 of the 1997 contract agreement with MIRROR NS Ltd., provides for the construction (and closure) of each cell. MIRROR NS (with their subcontractors Dexter and Dillon) submits a design and construction cost proposal for review. A cost substantiation review of the design and construction costs of Cell 5 (as has been done for the previous four cells) has been completed by HRM Solid Waste Resources staff and CBCL, owners engineer for the HRM. HRM staff and MIRROR NS are in agreement with the design, quantities, unit costs and total cost of Cell 5.

The Nova Scotia Department of Environment issued construction and operating approval for Cell 5 on May 30, 2008.

The total project cost for Cell 5 is \$14,679,982 (including net HST). This total includes \$85,000 for the design, quantity and cost review, and for on-site construction monitoring by CBCL Ltd. for twenty-one weeks of the construction phase of the project. Completion of Cell 5 is scheduled for December 2008.

Cell 5 Savings Opportunities:

i) The 08-09 Capital Budget includes \$15,600,000 for Construction of Cell 5: Based upon notification from MIRROR NS in December 2007, a total of \$17,500,000 is shown on page S12 of the 08-09 Proposed Business Plans and Budget book. In late March 2008, just prior to the approval of the 08-09 budget, MIRROR NS advised that the requirement for rock breaking/blasting was not necessary - which resulted in significant cost reduction of \$1,900,000 - yielding an estimated total price, before design and cost substantiation review, of \$15,600,000 - as shown on page J1 of the 2008-09 Approved Capital Supplementary Report and Four Year Plan book.

ii) Alternate Liner System:

On June 9, 2008, HRM staff received notification from MIRROR NS and Dillon Consulting of an opportunity for an additional potential savings of approximately \$687,000 (excluding taxes). The opportunity consists of a change in the landfill liner system, as follows:

replacing the 850mm soil liner with hydraulic conductivity of 5.0×10^{-6} cm/sec and 150mm bentonite amended soil liner with hydraulic conductivity 1.0×10^{-8} cm/sec (as approved by Nova Scotia Environment for Cells 1 through 4); with

12.5mm geosynthetic clay liner with hydraulic conductivity of 1.0×10^{-9} cm/sec and 1000mm native soil with hydraulic conductivity of 5.0×10^{-6} cm/sec.

The NS Environment Municipal Solid Waste Guidelines (October 1997) sets standards for the design of liner systems in landfills. For the soil portion of the landfill liner system, there is a standard design which may be amended with an admixture such as bentonite clay in order to achieve the required hydraulic permeability. The design of the soil portion of the liner system can be achieved by various alternative designs as long as the following general requirements of the liner system is met:

- the soil portion meets or exceeds the performance of the standard for that component of the liner system; and
- the design is compatible with the leachate.

MIRROR NS and Dillon have warranted that the proposed liner system meets and exceeds the NS Environment Guidelines for Landfills. MIRROR NS and Dillon advise that the rationale for the change in the liner system design, as compared to the first four cells at Otter Lake, is that the grade/slope (steepness) of Cell 5 is less than Cells 1 through 4, thus the design change is compatible with the more level grade/slope.

Attachment # 1 is the Typical Schematic Profile of Existing Liner System, Figure No SK-2 (Cells 1 to 4). Attachment #2 is the Typical Schematic Profile of the Proposed Liner System, Figure No. SK-3 (Cell 5 and potentially future cells).

MIRROR NS also advised that a decision was required by June 18, 2008, to proceed with the proposed alternate liner system, otherwise, due to the length of the project, the original more costly liner system would be installed.

On June 10, 2008, HRM Solid Waste Resources staff, having reviewed the proposal, contacted the NS Environment, Bedford office, to ascertain if the tight time line of their review of the proposal could be accommodated.

On June 11, 2008, after discussion with Councillor Bill Karsten, Chairman of the Solid Waste Resource Advisory Committee (SWRAC), the preferred approach of communication was that:

- members of SWRAC be provided a memorandum advising of the change in design and potential cost savings; and
- that the same information be provided to the Community Monitoring Committee (CMC),

with the condition that implementation is subject to approval by the NS Environment.

On June 16, 2008, the Executive of the CMC was advised of the proposed alternate design for the liner system. On June 21, 2008, a motion of non-objection to the change in the liner system was approved by the CMC, subject to approval by NS Environment.

The change in the cell liner design system for Cell 5 (and potentially future cells), as approved by NS Environment, does not change the other liner components, including the two 60 ml geomembranes (i.e. double liner) that are part of the liner system layers and does not negate the requirement for a full leachate detection and collection system for future cells - for the protection of the environment.

Attachment #3 is the final Otter Lake Facility - Residual Disposal Facility Cost Details, Cell #5 schedule.

On June 20, 2008, NS Environment approved the redesigned soil component of the liner system for Cell 5. A letter of appreciation and thanks has been provided to Mr. Don Feldman, District Manager, and Mr. Steve Westhaver, Manager, NS Environment Bedford office, for their prompt review and approval of the alternate liner system. This alternate design of the soil portion of the liner system has been approved and used on other landfills in Nova Scotia.

Based upon approval of the FY 2008/09 Capital Budget, and in consideration that Cell 5 requires a full construction season, the capital project has commenced.

The construction of Cell 5 in FY 2008-09 is consistent with the original cell requirement schedule established in 1998-99, which is a new cell every three years. Attachment #4 details the construction schedule for each of the nine cells with the utilized and estimated capacity for each cell.

BUDGET IMPLICATIONS

The total cost of the Construction of Cell 5 Otter Lake is \$14,679,982, including net HST. Funding is available in the 2008/09 Approved Capital Budget under Account No. CWI00782 as confirmed by Financial Services. As a provision against escalating contract prices with regards to future cell construction, the realized savings will remain within the Waste Resources Capital Reserve Q123 in an attempt to provide long term financial stability to this funding source.

Budget Summary: CWI00782 - Construction of Cell 5 Otter Lake

Cumulative Unspent and Uncommitted Budget	\$ 15,595,125
Less: Project cost	<u>\$ 14,679,982*</u>
Balance	\$ 915,413**

* This project was estimated in the Approved 2008/09 Capital Budget at \$15,600,000.

** The balance of funds will be deposited into Waste Resources Capital Reserve Q123.

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

1. Typical Schematic Profile Existing Liner System, Figure No. SK-2
2. Typical Schematic Profile Proposed Liner System, Figure No. SK-3
3. Otter Lake Facility - Residual Disposals Facility - Cell # 5 Cost Details
4. Otter Lake Cell - Construction Schedule - Utilization and Estimated Capacity

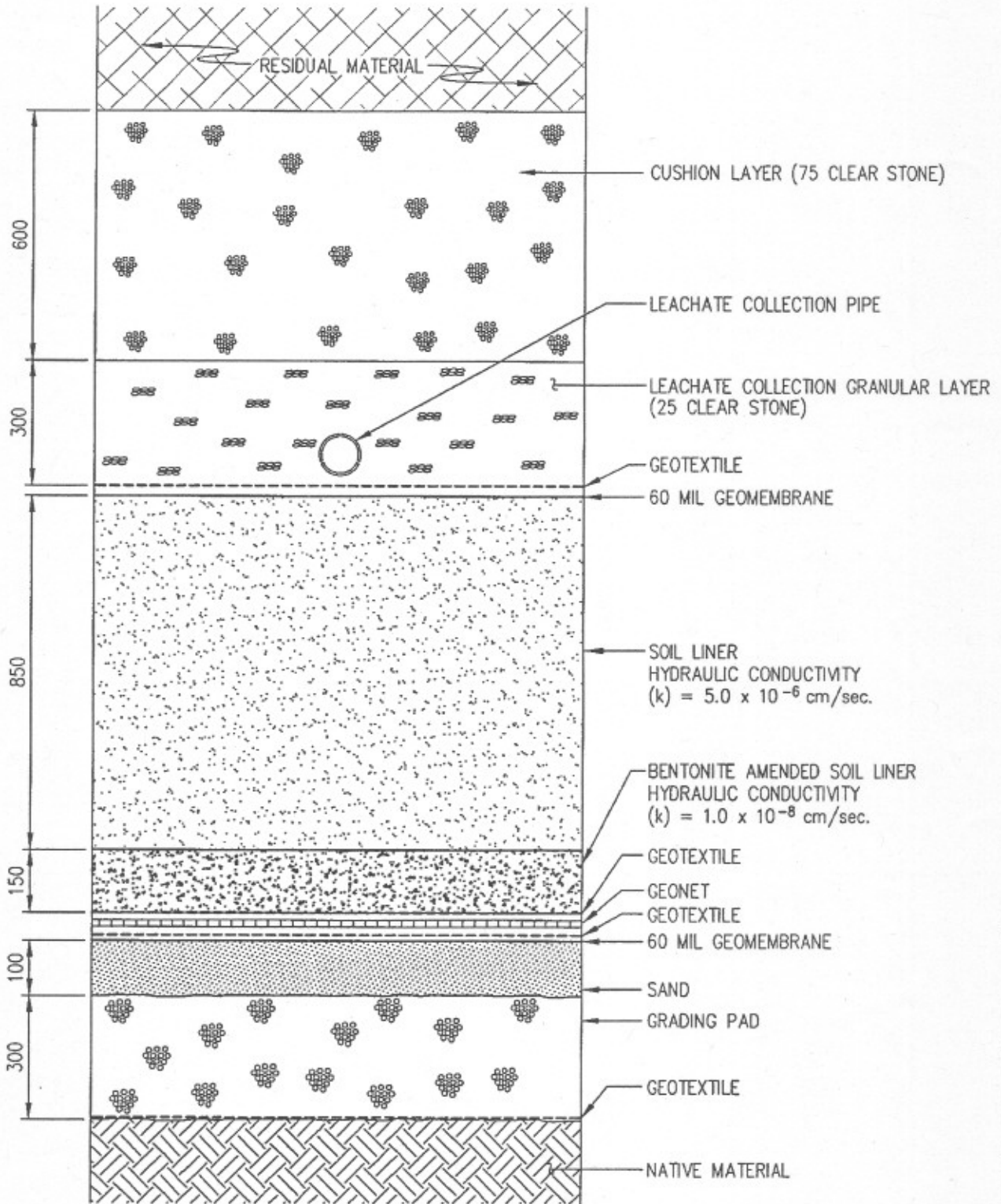
A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.html> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by :

 J i m



 Bauld, Manager, Solid Waste Resources, 490-6606



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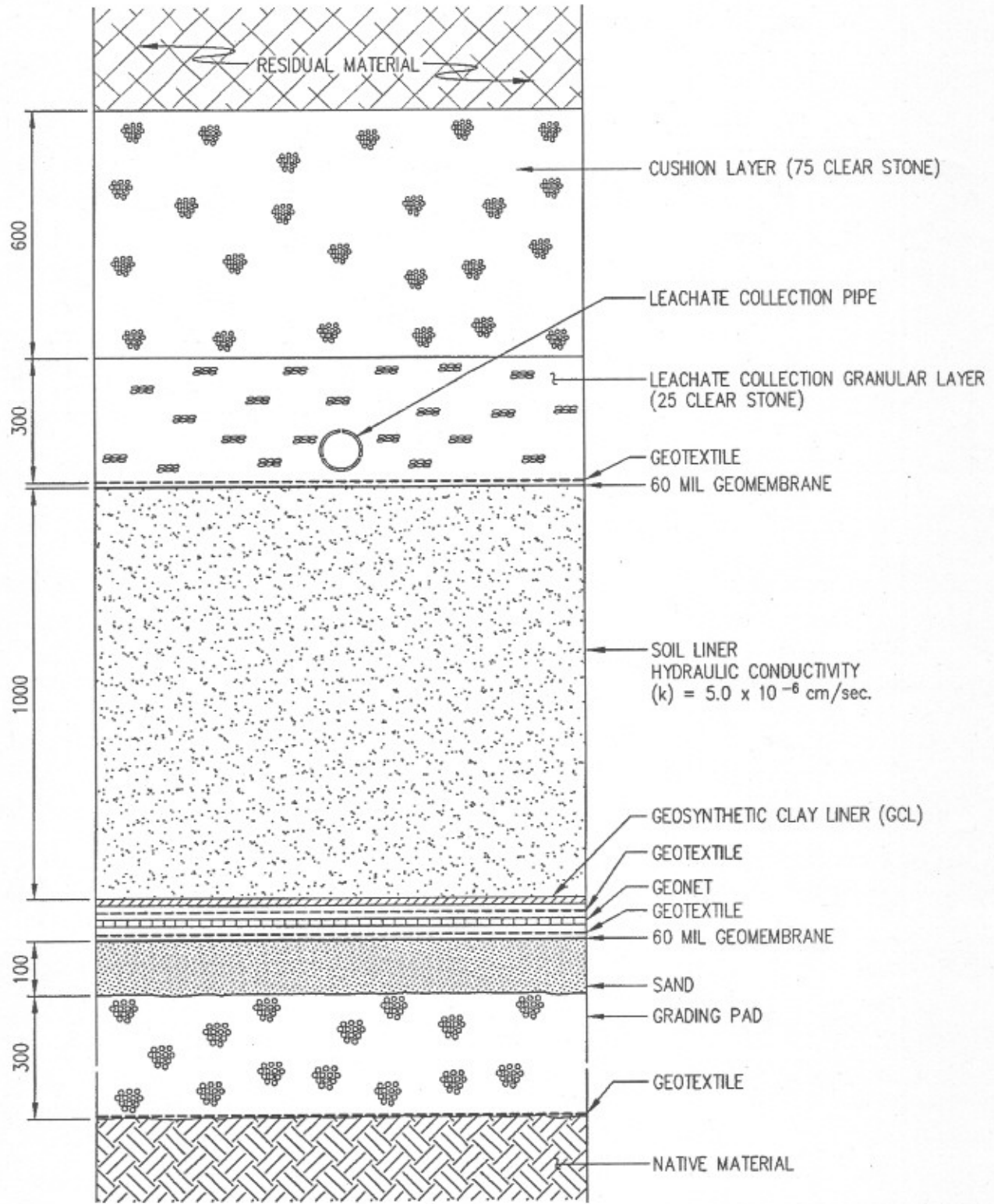
DATE **JUNE 2008**

TITLE
**TYPICAL SCHEMATIC
PROFILE OF EXISTING LINER SYSTEM**


PROJECT
**OTTER LAKE
MANAGEMENT FACILITY**

PROJECT No.
08-8782

FIGURE No.
SK-2



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 DILLON CONSULTING	TITLE	TYPICAL SCHEMATIC PROFILE OF PROPOSED LINER SYSTEM	PROJECT No.	08-8782
	PROJECT	OTTER LAKE MANAGEMENT FACILITY		FIGURE No.
DATE	JUNE 2008			

Attachment # 3

Otter Lake Facility - Residuals Disposal Facility

Cost Details - Cell # 5 with Geosynthetic Clay Liner (GCL)

Item	Description	Unit Measure	Unit Price	Quantity	Cost
1	Clear and Grub (450mm)	hectare	\$25,513.75	8.6	\$219,418.25
2	Site Grading - Cut and Fill	cubic metre	\$7.78	122,337	\$951,200.76
3	Rock Excavation	cubic metre	\$160.00	1,103	\$176,480.00
4	Site Grading - Imported Granulars - 700 / 1000 mm of 150 mm surge	cubic metre	\$19.92	14,247	\$283,835.86
5	Underdrain Piping	meter	\$90.00	2,431	\$218,790.00
6	Perimeter Berm	meter	\$585.00	212	\$124,020.00
7	Cell 5 / 6 Separation Berm	meter	\$585.00	615	\$359,775.00
8	Cell 4 / 5 Tie-in Berm	meter	\$220.00	578	\$127,160.00
9	Geotextile 'A' - Terrafix 300R	square metre	\$2.96	38,483	\$113,909.68
10	Grading Pad - 300mm	square metre	\$11.00	38,910	\$428,010.00
11	Sand Bedding - 100 mm	square metre	\$6.50	56,794	\$369,161.00
12	Geomembrane 60 mil HDPE	square metre	\$11.00	57,447	\$631,917.00
13	Geotextile 'A' - Terrafix 300R	square metre	\$3.00	56,816	\$170,448.00
14	Drainage Net	square metre	\$6.75	56,816	\$383,508.00
15	Geotextile "B" - Terrafix 800R	square metre	\$4.60	56,816	\$261,353.60
16	Geosynthetic Clay Liner	square metre	\$12.00	58,747	\$704,964.00
17	Soil Liner (1000mm)	square metre	\$35.00	57,204	\$2,002,140.00
18	Geomembrane 60 mil HDPE	square metre	\$11.00	57,795	\$635,745.00
19	Geomembrane Stormwater Barrier	meter	\$110.00	322	\$35,420.00
20	Geotextile "C" - Synthetic Industries 1601	square metre	\$5.90	57,795	\$340,990.50
21	Leachate Collection Piping - 150 mm HDPE	meter	\$125.00	1,826	\$228,250.00
22	Leachate Collection Header Piping - 200 mm HDPE	meter	\$125.00	116	\$14,500.00
23	Leachate Collection Stone 25 mm - 300 thk	square metre	\$12.00	50,206	\$602,472.00
24	Leachate Cushion Layer stone 75 mm - 600 thk	square metre	\$22.00	50,206	\$1,104,532.00
25	Leachate Stone Layer - clay on inside of cell 5/6 slope	square metre	\$30.00	6,051	\$181,530.00
26	Leachate Collection Sump Cleanout - 300 mm HDPE	meter	\$155.00	80	\$12,400.00
27	Leachate Forcemain - twinned (100 / 200 mm) c/w manhole	meter	\$412.43	235	\$96,919.88
28	Leachate Collection Pumping Station	lump sum	\$143,807.50	1	\$143,807.50
29	Leachate Collection Pumping Manholes - c/w 34 m of pipe	lump sum	\$30,000.00	1	\$30,000.00
30	Leachate Tank Header Building Expansion	lump sum	\$96,910.50	1	\$96,910.50
31	Leachate Tank Header Bldg Piping, Meters and Valves	lump sum	\$47,050.00	1	\$47,050.00
32	Leachate Piping to Holding Pond - c/w manholes	meter	\$200.00	71	\$14,200.00
33	Leak Detection Header Piping - 150 mm HDPE	meter	\$130.00	117	\$15,210.00
34	Leak Detection Extraction Piping - 500 mm HDPE	meter	\$1,000.00	21	\$21,000.00
35	Leak Detection Structure	lump sum	\$19,922.36	1	\$19,922.36
36	Cell 5 / 6 Berm Stormwater Surface Piping - 300 mm DR21 HDPE	meter	\$200.00	538	\$107,600.00
37	Electrical Power Extension	lump sum	\$25,000.00	1	\$25,000.00
38	Soil Plug	meter	\$500.00	106	\$53,000.00
39	Interior Toe Drain	meter	\$600.00	87	\$52,200.00
40	Litter Control Fencing	meter	\$212.00	804	\$170,448.00
41	Perimeter Road Extension at Top of Cell	meter	\$434.00	83	\$36,022.00
42	Access Road into Top of Cell c/w culvert, guardrail	meter	\$271.00	314	\$85,094.00
43	Access Road into Bottom of Cell c/w guardrail	meter	\$271.00	124	\$33,604.00
44	Hydroseeding	square metre	\$0.75	50,877	\$38,150.12
45	Borrow Pit Development and Closure	lump sum	\$350,000.00	1	\$350,000.00
46	Engineering and Quality Assurance	lump sum	\$577,031.00	1	\$577,031.00
47	Install Monitoring Well	lump sum	\$4,900.00	1	\$4,900.00
Sub Total					\$12,700,000.00
Margin					\$1,411,111.11
Total					\$14,111,111.11

Cell #	Capacity *	Amount used as of March 2008	Status (i.e. is it capped and closed, still open, etc.)
Cell 1	690,000 tonnes	all	capped and closed
Cell 2		all	capped and closed
Cell 3	470,000 tonnes	all	capped and closed
Cell 4	495,000 tonnes	80%	first half closed
Cell 5	anticipated capacity is 546,000 tonnes	-	under construction '08
Cell 6	anticipated capacity is 530,000 tonnes	-	scheduled to be built in 11/12
Cell 7	anticipated capacity is 500,000 tonnes	-	scheduled to be built in 14/15
Cell 8	anticipated capacity is 460,000 tonnes	-	scheduled to be built in 17/18
Cell 9	anticipated capacity is 80,000 tonnes	-	scheduled to be built in 20/21

*based on an assumed density of 730 kg/cm

- Total Capacity (estimated) 3,771,000 tonnes
- Original ('98/99 estimated) capacity 3,240,000 tonnes
- Additional/Optimized estimated capacity 531,000 tonnes⁽¹⁾
from adjusted foot print commencing with Cell 4

(1) Equal to 3 years use of Otter Lake residual disposal facility. Preserves original closure schedule of Cell 9 in 2025/26.