THE COLLECTION OF LANDFILL MONITORING DATA AT THE FORMER CAM-3 DEW LINE SITE

Shepherd Bay, Nunavut

FINAL REPORT– 2011 SEASON

(O/Ref.: CD9229) (Y/Ref.: DLC MON (Kitik 09)

DEFENCE CONSTRUCTION CANADA

February 2012

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1 INTRODUCTION

1.1 LOCATION AND SITE FEATURES

The CAM-3 Shepherd Bay DEW Line site is located on the southwest coast of the Boothia Peninsula in Nunavut at 68º 48' 38" N and 96º 26' 01" W. The site is located approximately 60 km southeast of the community of Taloyoak and about 10 km inland from the shore of Shepherd Bay.

The CAM-3 site is a former auxiliary radar site within the original DEW Line system that was converted to a North Warning System (NWS) Long Range Radar (LRR) site in 1989 as part of the North American Aerospace Defence Modernization Program.

Cleanup of the CAM-3 DEW Line site was completed in 2007. Infrastructure required as part of the NWS LRR remains on site.

The clean-up included the closure and remediation of five existing landfills, the construction of a landfill for the disposal of non-hazardous wastes generated from demolition and collection of site debris (NHWLF) and the construction of a second facility to contain Tier II soils. Monitoring activities were carried out at the following landfill areas, as shown on the overall site plan (Figure CAM-3.1) at the end of this section:

- Beach Landfill
- Non-Hazardous Waste Landfill
- Station Landfill
- Tier II Soil Disposal Facility
- Northeast Landfill
- USAF Landfill
- NWS Landfill

In accordance with the NTI-DND Cooperation Agreement, landfill monitoring is carried out following the site`s clean-up. Table I hereafter provides a synopsis of the field activities performed during the 2011 Landfill Monitoring Program at CAM-3 – Shepherd Bay.

Table I: 2011 Monitoring Requirements for the CAM-3 Landfills

Landfill	Visual Inspection	Soil Sampling	Groundwater Sampling	Thermal Monitoring
Beach Landfill	✓			
Non-Hazardous Waste Landfill	✓			
Station Landfill	✓			
Tier II Disposal Facility	✓	✓	✓	✓
Northeast Landfill	✓			
USAF Landfill	✓	✓	✓	✓
NWS Landfill	✓			

1.2 OBJECTIVES AND SCOPE OF WORK

The objective of the DCC Landfill Monitoring Program is to collect sufficient information to assess the landfills' performance from geotechnical and environmental perspectives. DCC has specified the requirements for the Landfill Monitoring Program in the document *Terms of Reference (ToR) – Consulting Services for the Collection of Landfill Monitoring Data – PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay DEW LINE SITES, NUNAVUT TERRITORY, KITIKMEOT REGION DCC PROJECT #: DLC MON*, October 7, 2008. (ToR, reference B).

The scope of work for the Landfill Monitoring Program is defined in the ToR and in Biogenie's accepted proposal dated April 2009 (reference C) that was submitted to DCC. The scope of work generally includes the following activities:

- Landfill Monitoring for each of the CAM-3 Landfills
- Visual inspection
- Soil and groundwater sampling (DCC Tier II Disposal Facility and USAF Landfill)
- Thermal monitoring (DCC Tier II Disposal Facility and USAF Landfill)
- Create photographic record
- Draft and Final reports

1.3 REPORT FORMAT

This report describes the work carried out in August 2011 at seven landfill sites at CAM-3 Shepherd Bay. Results from soil and groundwater sampling, thermal monitoring, and visual inspection of the sites are also presented in the formats described in the ToR. An electronic version of the report and its component tables, figures and data files is included in an Addendum DVD-ROM, which is appended to the report.

The report is organized with a separate chapter for each of the landfill areas. Each chapter contains all relevant information gathered for that landfill during the 2011 Landfill Monitoring Program. The following information is provided for each landfill:

- Visual inspection check-list
- Visual inspection drawing mark-up
- A selection of visual inspection photos
- Thermal monitoring summary (where applicable)
- Summary of 2011 soil analytical data (where applicable)
- Summary of 2011 groundwater analytical data (where applicable)
- Monitoring well development/sampling reports (where applicable)

For the photographic record, the printed copy of the report only includes an index and thumbnail image of photos for each of the landfill areas. The actual photos are included in electronic format in the Addendum DVD-ROM to the report. Certificates of Analysis, QA/QC analytical results and field notes are attached in appendices.

1.4 PROJECT REFERENCES

The following references are specifically relevant to the 2011 Landfill Monitoring activities:

A. *Request for Abbreviated Proposal- Consultant Services – Collection of Landfill Monitoring Data for the DEW Line Sites: PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay, Nunavut Territory - Kitikmeot Region. DCC Project # DLC MON (Kitik 09)*, February 19, 2009.

B. Terms of Reference – Consulting Services for the Collection of Landfill Monitoring Data – PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay DEW LINE SITES, NUNAVUT TERRITORY, KITIKMEOT REGION DCC PROJECT #: DLC MON, October 7, 2008.

C. Technical Proposal – The Collection of Landfill Monitoring Data for the DEW Line Sites: *PIN-3 Lady Franklin Point, PIN-4 Byron Bay, CAM-1 Jenny Lind Island, CAM-2 Gladman Point, CAM-3 Shepherd Bay, and CAM-4 Pelly Bay DEW LINE SITES, Kitikmeot Region, Nunavut. Project Ref 6121-060,* February 2008.

D. *Post-Field Progress Report, CAM-3 Landfill Monitoring 2011*, August 29, 2011.

SURVEY CONTROL MONUMENTS (LOCAL COORDINATES)				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
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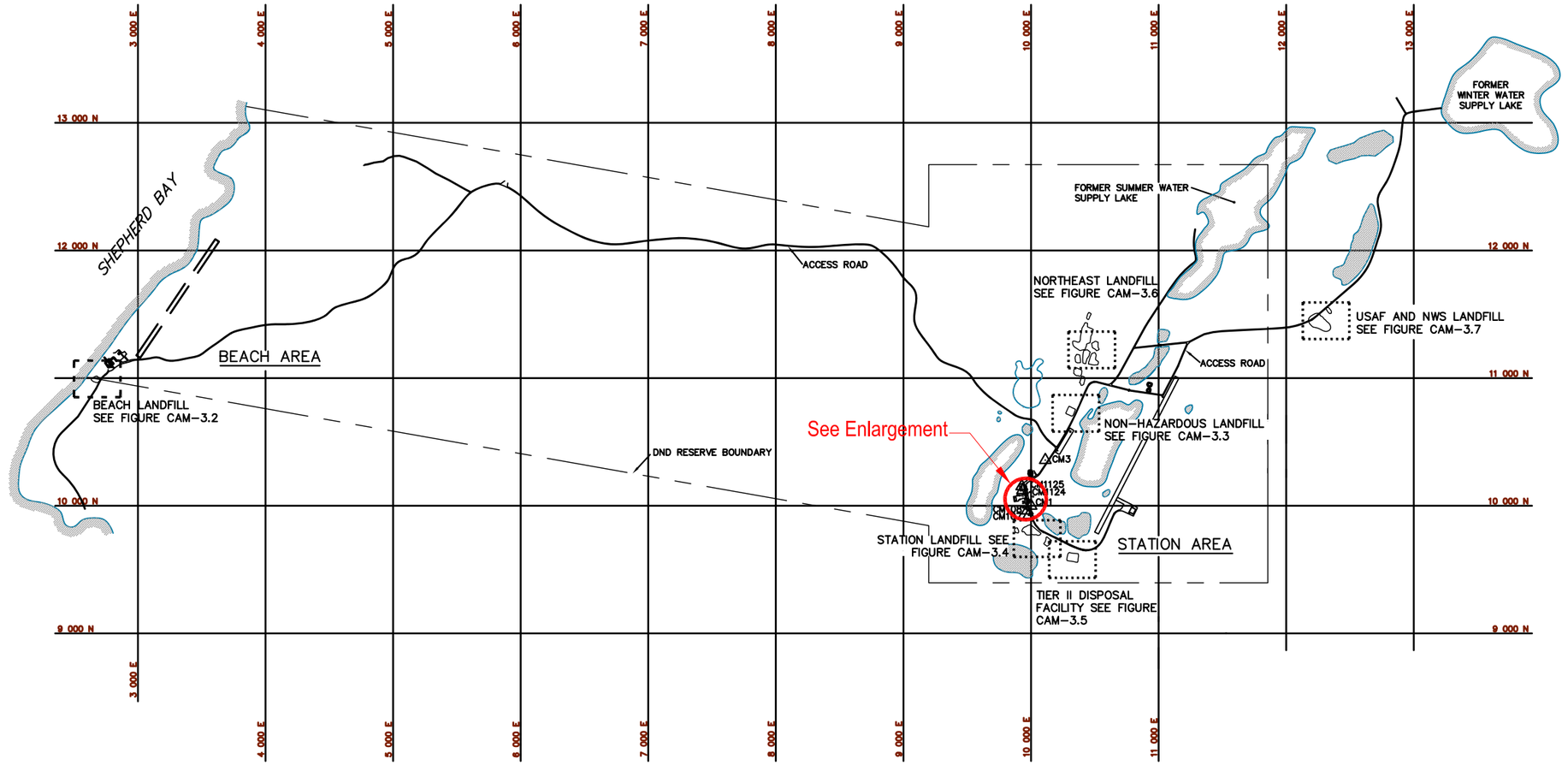
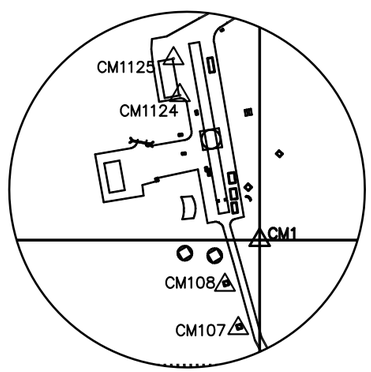
CM3	10 357.750	10 111.994	41.450	GSC MON. 749725
CM107	9 926.007	9 982.062	43.107	DMA MON. 11811
CM108	9 962.344	9 970.897	42.690	DMA RM. 11811
CM1124	10 121.226	9 933.143	43.418	TECSULT
CM1125	10 152.084	9 927.809	43.406	TECSULT





Enlargement
Scale 1 = 5,000

LEGEND

CM1 △ SURVEY CONTROL MONUMENT

0 400m 800m 1200m 1600m 2000m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
A	FINAL	12–01–26	P.L.	A.P.	P.G.

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FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

OVERALL SITE PLAN

SITE REMEDIATION SOLUTIONS
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Phone: (418) 653-4422 Fax.: (418) 653-3583

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 40,000	JANUARY 2012
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS
PROJECT NO: CD9229_002_160	DRAWING NO: CD9229_002_160-CAM-3_1	PAGE LS

FIGURE CAM-3.1

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2 OUTLINE AND METHODOLOGY

2.1 FIELD PROGRAM STAFF

The 2011 on-site field program at CAM-3 Shepherd Bay took place from August 14 to 17, 2011. Biogenie sub-contracted Sila Remediation Inc. from Igloolik, Nunavut to perform the fieldwork. The Sila field program was executed by Mr. Andrew Passalis and five local Inuit representatives.

The team was made up of the following individuals:

- Andrew Passalis, Project Engineer
- Brandon Langan, Field Technician
- Susie Koaha, Field Technician
- Kalene Epilon, Field Technician
- Joe Koaha, Wildlife Monitor

2.2 2011 WEATHER CONDITIONS

Seasonally warm weather conditions were observed during the CAM-3 Shepherd Bay monitoring event with daytime temperatures ranging between 6-8ºC in the morning and warming up to daytime highs of 8-12ºC for the duration of the monitoring period (August 14-16). Skies were generally overcast throughout the monitoring period, with skies eventually clearing later on August 16th and remained clear until departure from site the following day (August 17th). Winds generally ranged between 25-35 km/hr from the northwest during the initial two days decreased to between 5-10 km/hr on the final day of monitoring. No precipitation was observed during the monitoring event.

2.3 VISUAL INSPECTION

Data and information collected during the visual inspection of the CAM-3 landfills are included in the visual inspection datasheets. These datasheets include such inspection data as the location of settlement, erosion, frost action, sloughing and cracking, animal burrows, vegetation cover and stress, staining, seepage points, exposed debris, and any other features of note.

Each feature was identified with an alphabetical tag to be used consistently each year in an effort to track changes in condition for each specific feature. New features are added to the checklist and are noted as new observations. This letter is shown on the figures for each landfill along with the symbol for the particular feature.

Digital photos with a measure of scale were taken to show the actual general state of the landfills as well as features of interest. Annotated sketches/diagrams are included in the present report for each landfill. Some photos are provided for supplemental purposes only and do not warrant placement on the Figures (i.e., they are not specifically referenced in the report or within the tables).

The photos were taken with a Sony DSC-TX5 10.2 megapixel (MP) digital camera. Full resolution digital jpg copies are furnished on a DVD-ROM appended with the final report. The photo log, including the local coordinates from where the photo was taken, orientation (relative to map north), feature of note and picture numbers are included in each landfill report.

2.4 SOIL SAMPLING

The soil sampling methodology conformed to guidance provided in the following Canadian Council of Ministers of the Environment (CCME) documents:

- CCME Guidance Document on the Management of Contaminated Sites in Canada, April 1997, CCME PN 1279. (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf)
- CCME EPC-NCS62E Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites - Volume I: Main Report, Dec 93 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf)
- CCME EPC-NCS66E Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites - Volume II: Analytical Method Summaries, Dec 93 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf)
- Reference method for the Determination of Petroleum Hydrocarbons in Soil – Tier I Method, 2001
- CCME Subsurface Assessment Handbook for Contaminated Sites, March 1994, EPC-NCSRP-48E (http://www.ccme.ca/publications/ceqg_rcqe.html)

For the 2011 monitoring event, 4 soil sampling stations were visited. One surface sample (0-15 cm depth below surface) and 1 subsurface sample (40-50 cm depth below surface) were taken at each sampling station. No frozen ground or frost was encountered at the soil stations during the August 2011 sampling.

As specified in the ToR, the following soil sampling procedures were adhered to:

- Where required, the soil samples were collected from locations between 2-4 m radius of the monitoring wells
- Blind field duplicates (10 %) were collected for Quality Assurance and Quality Control purposes
- Duplicate samples (10 %) were also taken and sent to a second laboratory for quality control purposes
- An additional 10 % of the soil samples taken were sent to the owner's representative (ESG OPS CENTRE) in Kingston for archiving as specified by DCC

The soil samples were analyzed for requested parameters (TPH (F1-F3), total metals and PCBs) as specified by DCC. Table II below summarizes the soil sampling at CAM-3 during the August, 2011 field program.

Table II: Summary of Soil Sampling at CAM-3 – August 2011

Landfill Site	**Soil Sample Locations**			
Tier II Disposal Facility	MW-4	MW-5	MW-6	MW-7
USAF Landfill	MW-12	MW-13	MW-14	MW-15

Notes:
Soil samples annotated as "MW" were collected as per the ToR between 2-4 metres from monitoring wells.
All soil samples were collected from two depths (0-15 cm and 40-50 cm). For 2011 sampling, total no. of soil samples = 22 samples (8 samples x 2 depths + 2 QA/QC + 2 (Inter-laboratory comparison) + 2 for Owner's Representative (ESG Archives)

2.5 GROUNDWATER SAMPLING

The soil sampling methodology conformed to guidance provided in the following Canadian Council of Ministers of the Environment (CCME) documents:

- CCME EPC-NCS62E Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites - Volume I: Main Report, Dec 93 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf)
- CCME EPC-NCS66E Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites - Volume II: Analytical Method Summaries, Dec 93 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf).

Wells were purged as specified and measurements of *in situ* temperature, conductivity and pH were taken. Sampling took place when these parameters were stabilized. Turbidity readings were also collected at each station. The samples were not acidified and were not filtered (as directed in ToR).

The 2011 field program included sampling only 4 of the 8 monitoring wells at CAM-3. Three wells at the Tier II Disposal Facility and 1 well location at the USAF Landfill were dry at the time of monitoring and consequently could not be sampled. A summary of the status of the monitoring wells and the attempts made are summarized in Table III.

All monitoring wells were inspected and found to be in good condition with no significant concerns identified, with the exception of MW-5, where well heaving was noted. In sampled wells, no sign of free-phase hydrocarbon product was detected. Monitoring Well Development and Sampling Record forms are included in appropriate sections of this report.

Table III: Summary of Groundwater Sampling at CAM-3 – August 2011

Landfill Site	**Groundwater Sample Locations**			
Tier II Disposal Facility	MW-4 (dry)	MW-5 (dry)	MW-6 (dry)	MW-7
USAF Landfill	MW-12 (dry)	MW-13	MW-14	MW-15

Notes:
For 2011 sampling, total no. of water samples = 7 samples (4 monitoring well samples + 1 blind duplicate + 1 inter-laboratory duplicate + 1 field blank) + 1 travel blank.

2.6 THERMAL MONITORING

All thermistors at the Tier II Disposal Facility and USAF Landfill were inspected and found to be in good condition with no significant concerns identified other than battery levels in two dataloggers which reported fair (VT-3) to low (VT-6) conditions. Data from all thermistors was successfully retrieved with the exception of VT-3 where a complete memory dump was required due to bad data arguments during routine downloading and at VT-6 where all communications failed due to extremely low battery levels. All analogues/thermocouples were observed to be functioning properly. Where possible, internal memories were reset and clocks were synchronized using the Prolog software.

Specific detailed information regarding temperature data is contained in the report section on the Tier II Disposal Facility and USAF Landfill. Raw data retrieved directly from the dataloggers was provided to DCC with the field progress report on August 29, 2011. The manual thermal monitoring data is presented in tabular form on the thermistor inspection sheets for each landfill.

2.7 FIELD NOTES AND DATA

Field notes from the 2011 landfill monitoring program, including soil and water sampling are included in Appendix B for reference. Notes were written on waterproof field sheets and in field books and the notes scanned to an Adobe pdf document for future reference and back up. Locations of all observations and features for the visual inspection were recorded using a hand-held Garmin Oregon 300 GPS device, which included a combination of continuous tracks and discrete waypoints. Data packages collected from the individual vertical thermistors were downloaded directly to a field laptop computer.

2.8 QUALITY CONTROL

Sila implemented standard sample collection techniques to decrease the likelihood of compromising collected samples. The methods used for sample collection are summarized in Sections 2.4 and 2.5 of this report. The following measures were taken to minimize sample cross-contamination:

- All samples were placed directly into the appropriate laboratory supplied containers (for the particular analysis)
- Soil samples were collected with the use of decontaminated sampling equipment and/or nitrile gloves that were used only once
- Water samples were collected through the use of dedicated Waterra foot valves and tubing
- All samples were stored in chilled coolers/refrigerators throughout the field program and chilled coolers during subsequent transfer to the respective laboratory.

Chain of Custody (COC) forms were completed by the Project Engineer after sample collection. The samples were refrigerated prior to off-site shipment by First Air Cargo directly to Maxxam (via Yellowknife) and Exova in Edmonton and ESG, via Ottawa to Kingston, Ontario where they were checked in by laboratory representatives. All analyses were completed as specified on COC forms.

2.9 QA/QC PROCEDURES

Sila used standard QA/QC procedures as specified in the TOR and CCME Guidance Documents for this project. The following is a summary of the analytical QA/QC samples collected:

- 10% Blind Duplicate Samples of soil and water were sent to Maxxam
- 10% Interlab Duplicate Samples were sent to Exova (looking for variation in procedures causing significant difference in analytical result). Results for both the blind duplicates and the interlab duplicates can be found in Appendix C, as actual values and relative percent differences
- 10% Archival Samples of soil to ESG (soils).

Maxxam has QA/QC measures for sample analysis. Maxxam QC samples will typically be introduced into the analytical stream on a batch basis, normally comprising 20% – 30% of the total sample throughput. A batch size of 15 – 20 typically includes one of each control standard, reference standard, surrogate spike, duplicate sample, and method blank. A **control sample** is a blank matrix fortified with analyte of interest and carried through all analytical steps to monitor lab performance (recovery & basis) on clean matrix. A **reference sample** is a sample with predetermined certified characteristics that undergoes the same processing as samples used to evaluate accuracy of procedure. A **surrogate spike** is an organic compound with similar chemical composition and behaviour in the analytical process used to monitor recovery in each sample. A **duplicate sample** occurs when client samples are analyzed in duplicate to monitor reproducibility in analysis and preparation. Finally, a **method blank** is a blank sample matrix carried through the same procedure as the samples, and is used to monitor for process contamination.

Exova follows similar in-house QA/QC procedures. Maxxam and Exova QA/QC reports can be found in Appendix C.

3 BEACH LANDFILL

3.1 BACKGROUND AND MONITORING PROGRAM

The Beach Landfill area is located approximately 100 m south of the Beach POL tanks and 50 m east of the ocean. The landfill is located within a relatively flat lying area that historically had been used for material storage. The landfill has one regrade area and, including engineered cover, encompasses a footprint of approximately 2,500 m^2 with the final cover extending approximately 0.75 m above the surrounding grade. Based on existing information regarding this landfill as a source of contamination, its potential migration pathways and receptors, the Beach Landfill was classified as low potential environmental risk. The remediation consisted of regrading with the placement of additional granular fill.

The long term monitoring plan consists of visual monitoring and collection of soil samples.

The 2011 monitoring of this landfill includes a visual inspection to assess landfill performance. There is no instrumentation installed at this landfill.

3.2 VISUAL INSPECTION REPORT

The visual inspection of the Beach Landfill was conducted on August 14, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table IV of this report.

Settlement
Indications of minor settlement were noted at several locations, including one sizeable (9 x 7 m) depression situated on the west area of the landfill surface (Feature A). Several smaller linear and pot-hole type depressions were also noted along the south, north and east sides of the landfill surface (Features A and B). The depth of these settlement features varied between 2 and 10 cm. These features are consistent with the previous 2009 and 2010 observations and have an acceptable severity rating.

Erosion
Three areas of erosion were noted on the southeast (Feature C) side slope and cover and southwest (Feature D) side of the Beach Landfill, including one elongated feature extending across the east corner and two relatively localized areas on the side slopes to the east and south. All areas appear to be associated with possible minor settlement that has resulted in directed runoff and washing of fines from the landfill cover. These features appear to be consistent with the previous 2009 and 2010 observations. All features appear to be self-armouring and have an acceptable severity rating.

Minor erosion was also noted along the constructed drainage channel extending around the northeast and south sides of the landfill and appears consistent with planned remedial measures to direct flow around the landfill. The erosion is not in direct contact with the landfill. The channel was dry at the time of the 2011 inspection with no observable changes from the 2009 or 2010 landfill inspections.

Frost Action
No evidence of frost action was noted.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
No evidence of vegetation was noted on the landfill.

Staining
No evidence of staining was noted on or around the landfill.

Seepage Points
No areas of seepage were noted at the landfill.

Debris
No evidence of debris were noted at the landfill.

Presence/Condition of Monitoring Instruments
No monitoring instrumentation is installed at this landfill.

Other Features of Note
With the exception of the surface drainage features extending around the northeast and south sides of the landfill (noted above), no other features were noted at the landfill.

Discussion
The Beach Landfill performance with respect to containment of the debris within the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawing, is presented in the following pages.

It was noted that surface runoff has resulted in minor erosional features on the east and southwest sides of the landfill surface. These features appear to be generally consistent with findings from the 2009 and 2010 inspections. Both features appear to be self armouring along the downgradient slopes.

Table IV: Visual Inspection Checklist / Report – Beach Landfill

DEW LINE CLEANUP: POST-CONSTRUCTION – LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 of 2

SITE NAME: CAM-3 – Shepherd Bay
LANDFILL DESIGNATION: Beach Landfill (Regrade Landfill)
DATE OF INSPECTION: August 14, 2011
DATE OF PREVIOUS INSPECTION: August 16, 2010
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: Cam-3 Shepherd BAY
Landfill: Beach Landfill
Designation: Regrade Landfill
Date Inspected: August 14, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature: 

CAM-3 BEACH LANDFILL

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure CAM-3.2 (west and south sides)	3 - 9 m	3 - 7 m	2 - 10 cm	Occassional	Numerous subtle depressions on across surface and side slopes	BLF-10, 11, 18, 19, 23	Acceptable	Subtle depressions on landfill surface.
		FEATURE B See Figure CAM-3.2 (north and east sides)	0.5 - 10 m	0.6 - 1 m	5 - 10 cm	Occassional		BLF-5, 8, 9		
Erosion	Yes	FEATURE C See Figure CAM-3.2 (southeast cover and side slope)	5 - 10 m	0.2 m	2 - 10 cm	Isolated	Minor surface erosion	BLF-20, 21, 22	Acceptable	Erosion and subtle depression likely due to washing of fines. Self armouring.
		FEATURE D See Figure CAM-3.2 (southwest slope)	2 - 3 m	0.1 m	2 - 3 cm	Isolated	Minor surface erosion	BLF-14, 15	Acceptable	Erosion resutling in washing of fines. Self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Animal Burrows	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Vegetation	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Staining	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Vegetation Stress	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Seepage Points	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Debris Exposed	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	None
Other Features of Note:	Yes	See Figure CAM-3.2 North and south sides	N/A	N/A	N/A	None	Shallow drainage features	BLF-3, 17	N/A	Surface runoff directed around landfill. Not in contact with landfill.
Additional Photos	Yes	See Figure CAM-3.2 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

3.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the Beach Landfill has been completed as per the ToR and is included as Table V below.

Table V: Preliminary Stability Assessment – Beach Landfill

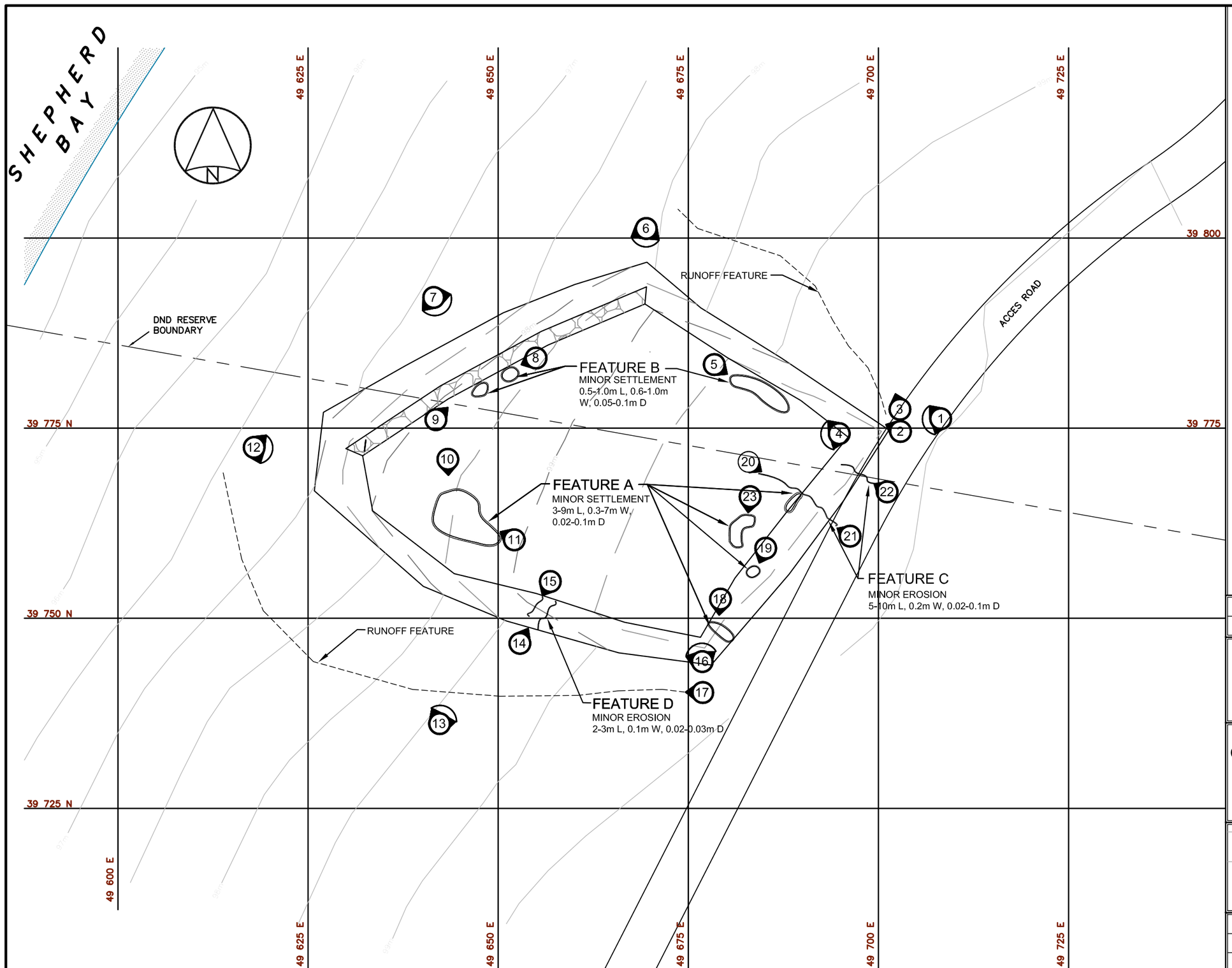
Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

3.4 LOCATION PLAN

The Location Plan for the Beach Landfill has been completed as per the ToR and is presented in Figure CAM-3.2.



LEGEND

- (3) PICTURE NUMBER VIEWPOINT
- SETTLEMENT (NTS)
- EROSION (NTS)

0 5m 10m 15m 20m 25m

NO.	VERSION	DATE	P.L. PAR	A.P. VERIF.	P.G. APPR.
A	FINAL	12-01-26			

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FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

BEACH LANDFILL

SITE REMEDIATION SOLUTIONS

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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 500	JANUARY 2012
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS
PROJECT NO: CD9229_003_160	DRAWING NO: CD9229_003_160-CAM-3_2	PAGE PL

FIGURE CAM-3.2

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3.5 PHOTOGRAPHIC RECORDS

The Photographic Record for the Beach Landfill has been completed as per the ToR and is included as Table VI hereafter. The Photographic Record contains only an index and “thumbnail” photographs. Full sized photographs are contained in the Addendum DVD-ROM.

Table VI: Landfill Visual Inspection Photo Log – Beach Landfill

Photo (BLF-)	Thumbnails	Filename	Date	Vantage Point		Caption
				Easting	Northing	
1		C311_4290	2011-08-14	49708	39776	Panoramic view looking SSW to NW from access road on northeast side of Beach Landfill
2		C311_4292	2011-08-14	49703	39775	View looking NW along dry drainage channel extending along northeast side of Beach Landfill
3		C311_4293	2011-08-14	49703	39777	View looking N along drainage channel located northeast of Beach Landfill (dry)
4		C311_4294	2011-08-14	49695	39774	Panoramic view looking SW to NW across cover from northeast corner of Beach Landfill
5		C311_4295	2011-08-14	49679	39783	View looking SE at minor depression on northeast side of Beach Landfill (10m L, 0.8m W, 5cm D) - Feature B
6		C311_4296	2011-08-14	49669	39801	Panoramic view looking SE to SW across cover from north corner of Beach Landfill
7		C311_4297	2011-08-14	49641	39792	Panoramic view looking E to SW from downgradient (northwest) side of Beach Landfill
8		C311_4298	2011-08-14	49655	39784	View looking SW at two depressions on north crest of Beach Landfill cover (0.5-1.0m L, 0.6-1.0mW, 5-10cm D) - Feature B
9		C311_4299	2011-08-14	49642	39776	View looking NE at two depressions on north crest of Beach Landfill cover (0.5-1.0m L, 0.6-1.0mW, 5-10cm D) - Feature B
10		C311_4300	2011-08-14	49643	39771	View looking S at large subtle depression on west side of Beach Landfill cover (9m L, 7m W, 2-10cm D) - Feature A
11		C311_4301	2011-08-14	49652	39760	View looking NW at large subtle depression on west side of Beach Landfill cover (9m L, 7m W, 2-10cm D) - Feature A
12		C311_4302	2011-08-14	49618	39773	Panoramic view looking NE to SE from end of breakwater wall west side of Beach Landfill
13		C311_4303	2011-08-14	49642	39736	Panoramic view looking NNW to E from southwest side of Beach Landfill
14		C311_4304	2011-08-14	49653	39747	View looking NE at minor erosion on southwest slope of Beach Landfill (2-3m L, 0.1m W, 2-3cm D) - Feature D

Table VI (Continued): Landfill Visual Inspection Photo Log – Beach Landfill

15		C311_4305	2011-08-14	49657	39755	View looking SW at minor erosion on southwest slope of Beach Landfill (2-3m L, 0.1m W, 2-3cm D) - Feature D
16		C311_4306	2011-08-14	49676	39745	Panoramic view looking NW to NE across cover from southeast corner of Beach Landfill
17		C311_4307	2011-08-14	49677	39740	View looking looking W at shallow drainage feature extending around the south side of Beach Landfill
18		C311_4308	2011-08-14	49679	39753	View looking S at subtle depression on south corner of Beach Landfill cover (2.5m L, 0.2m W, 3-5cm D) - Feature A
19		C311_4309	2011-08-14	49686	39761	View looking SSW at subtle depression on southeast cover of Beach Landfill (1m L, 1m W, 0.1m D) - Feature A
20		C311_4311	2011-08-14	49683	39771	View looking SE at erosion feature extending along east side of Beach Landfill (10m L, 0.2m W, 2cm D) - Feature C
21		C311_4312	2011-08-14	49696	39761	View looking NW at linear erosion feature extending along east side of Beach Landfill (10m L, 0.2m W, 2cm D) - Feature C
22		C311_4313	2011-08-14	49701	39767	View looking NW at minor depression on northeast side of Beach Landfill (10m L, 0.8m W, 5cm D) - Feature C
23		C311_4314	2011-08-14	49683	39766	View looking S at horseshoe shaped depression on surface of Beach Landfill (5m L, 0.3m W, 3cm D) - Feature A

4 NON-HAZARDOUS WASTE LANDFILL

4.1 BACKGROUND AND MONITORING PROGRAM

The Non-Hazardous Waste Landfill (NHWLF) is located approximately 650 m north-northeast of the module train and 200 m south of the Northeast Landfill. The landfill, including granular cover, encompasses a footprint of approximately 3,600 m^2 with the final cover extending between 2.5 to 4.0 m above the surrounding grade. This landfill was constructed for the disposal of non-hazardous wastes, site debris and DCC Tier I and Type A hydrocarbon-impacted soil. Landfill materials are contained by a granular perimeter berm and cover. Three groundwater monitoring wells are installed at the landfill perimeter.

The long-term monitoring plan consists of visual monitoring, and periodic collection of soil and groundwater samples.

The 2011 monitoring of this landfill includes visual inspection to assess landfill performance. Locations of groundwater monitoring wells installed at this landfill are identified in Figure CAM-3.3.

4.2 VISUAL INSPECTION REPORT

The visual inspection of the NHWLF was conducted on August 16, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table VII of this report.

Settlement
Indications of localized settlement were noted at three areas (Feature A) on the landfill, including: one oval-shaped depression below the crest at the top of the southwest facing slope; three elongated shallow depressions near the crest on the northwest facing slope; and one localized depression near the base of the side slope on the east corner of the landfill. With the exception of an additional elongated depression within an erosion feature on the northwest crest and small depression on the east corner, these features appear consistent with the 2009 and 2010 inspections and have an acceptable severity rating.

Erosion
Evidence of minor surface erosion was noted at a single location (Feature B) on the northwest facing slope of the landfill. This feature consisted of shallow surface erosion that extended perpendicular to the slope from crest to toe. The area affected appears to be self-armouring and has an acceptable severity rating. This feature appears unchanged from the 2010 inspection period.

Frost Action
No evidence of frost action was noted.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
No evidence of vegetation was noted.

Staining
No areas of staining were observed at the time of the inspection.

Seepage Points
There was no seepage point at this landfill.

Debris
One partially exposed piece of metal debris was noted on the landfill surface (Feature C), consisting of a 15 x 5 cm exposed piece of angular metal (bed rail). This feature appears unchanged from the 2009 and 2010 inspections. There was no other indication of debris at the landfill.

Presence/Condition of Monitoring Instruments
All monitoring well installations were found to be in good condition at the landfill.

Other Features of Note
A small crack was noted on the west side slope (Feature D), consisting of a 150 x 1.5 cm desiccation of tension crack.

Discussion
The NHWLF performance with respect to containment of the debris within the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawing, is presented in the following pages.

Table VII: Visual Inspection Checklist / Report – NHWLF

DEW LINE CLEANUP: POST-CONSTRUCTION – LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 of 2

SITE NAME: CAM-3 Shepherd Bay
LANDFILL DESIGNATION: NHWLF (New Landfill)
DATE OF INSPECTION: August 16, 2011
DATE OF PREVIOUS INSPECTION: August 16, 2010
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: CAM-3 Shepherd Bay
Landfill: Non-Hazardous Waste Landfill
Designation: New Landfill
Date Inspected: August 16, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature: 

CAM-3 NON - HAZARDOUS WASTE LANDFILL

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure CAM-3.3 (south and northwest crests) 2 New Obs.	0.5 - 5 m	0.2 - 2 m	2 - 10 cm	Isolated	Subtle depressions	NHWLF-38, 39, 41	Acceptable	Subtle depressions along south and west sides of landfill cover.
Erosion	Yes	FEATURE B See Figure CAM-3.3 (west side slope)	12 m	1 m	2 - 3 cm	Isolated	Minor erosion	NHWLF-40	Acceptable	Minor erosion in heavy equipment tracks. Washing of fines. Self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Vegetation	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Staining	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Debris Exposed	Yes	FEATURE C See Figure CAM-3.3 (centre of cover)	0.15 m exposed	5 cm exposed	Unknown	Isolated	Metal bed rail	NHWLF-32, 33	Acceptable	Partially exposed metal debris observed at one location.
Presence/Condition of Monitoring Instruments	Yes	See Figure CAM 3.3 MW-1 to MW-3	N/A	N/A	N/A	N/A	N/A	NHWLF-1W, 2W, 3W	Acceptable	The monitoring wells were in good condition.
Other Features of Note	Yes	FEATURE D See Figure CAM-3.3 (west side slope)	0.12 m	1.5 cm	Unknown	Isolated	Crack on west side slope	NHWLF-29	Acceptable	Tension / desiccation crack.
Additional Photos	Yes	See Figure CAM-3.3 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

4.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for NHWLF has been completed as per the ToR and is included as Table VIII hereafter.

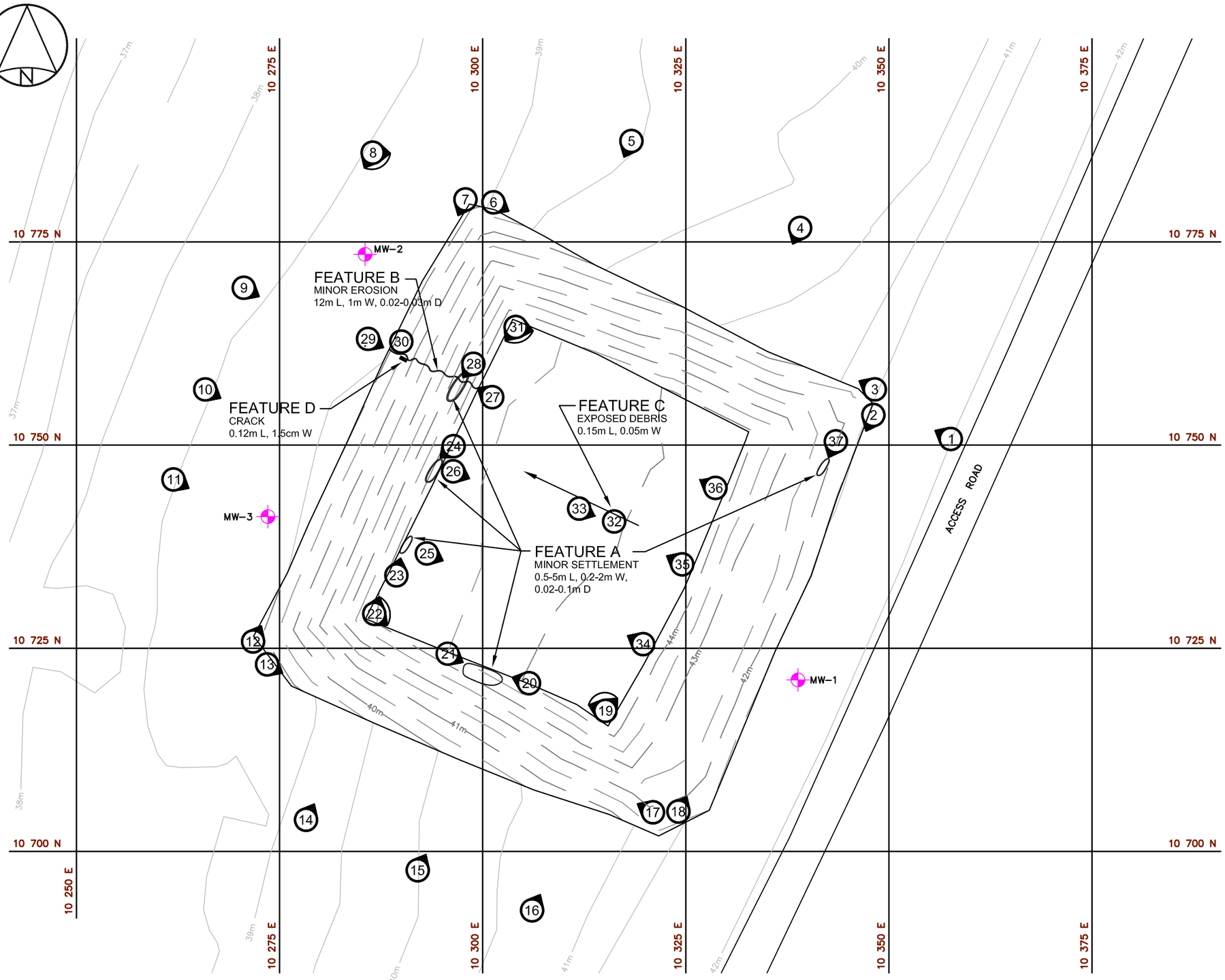
Table VIII: Preliminary Stability Assessment – NHWLF

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

4.4 LOCATION PLAN

The Location Plan for the NHWLF has been completed as per the ToR and is presented in Figure CAM-3.3.



LEGEND

- MONITORING WELL LOCATION
- PICTURE NUMBER VIEWPOINT
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (NTS)

0 5m 10m 15m 20m 25m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
A	FINAL	12-01-26	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

NON-HAZARDOUS WASTE LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 500	JANUARY 2012
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS
PROJECT NO: CD9229_001_160	DRAWING NO: CD9229_001_160-CAM-3_3	PAGE PL

FIGURE CAM-3.3

4.5 PHOTOGRAPHIC RECORDS

The Photographic Record for NHWLF has been completed as per the ToR and is included as Table IX hereafter. The Photographic Record contains only an index and “thumbnail” photographs. Full-sized photographs are contained in the Addendum DVD-ROM.

Table IX: Landfill Visual Inspection Photo Log – NHWLF

Photo (NHWLF-)	Thumbnails	Filename	Date	Vantage Point		Caption
				Easting	Northing	
1		C311_4573	2011-08-16	10358	10751	View looking NW at northeast corner of NHWLF from roadway
2		C311_4574	2011-08-16	10348	10755	View looking SW along southeast toe of NHWLF
3		C311_4575	2011-08-16	10348	10756	View looking NW along northeast toe of NHWLF
4		C311_4576	2011-08-16	10339	10777	View looking SW at northeast side of NHWLF
5		C311_4577	2011-08-16	10318	10787	View looking SW at northeast side of NHWLF
6		C311_4578	2011-08-16	10300	10780	View looking SE along northeast toe of NHWLF
7		C311_4579	2011-08-16	10299	10780	View looking SW along northwest toe of NHWLF
8		C311_4580	2011-08-16	10287	10786	Panoramic view looking E to SW from northwest of NHWLF. MW-2 in foreground.
9		C311_4581	2011-08-16	10271	10769	View looking SE along northwestt side of NHWLF
10		C311_4583	2011-08-16	10266	10757	View looking SE along northwestt side of NHWLF
11		C311_4584	2011-08-16	10262	10745	View looking SE along northwestt side of NHWLF. MW-3 in foreground.
12		C311_4585	2011-08-16	10272	10725	View looking NE along northwest toe of NHWLF
13		C311_4586	2011-08-16	10273	10724	View looking SE along southwest toe of NHWLF
14		C311_4587	2011-08-16	10278	10703	View looking NE at west corner of NHWLF

Table IX (Continued): Landfill Visual Inspection Photo Log – NHWLF

15		C311_4588	2011-08-16	10292	10698	View looking NE at southwest side of NHWLF
16		C311_4589	2011-08-16	10306	10692	View looking NE at southwest side of NHWLF
17		C311_4590	2011-08-16	10322	10705	View looking NW along southwest toe of NHWLF
18		C311_4591	2011-08-16	10323	10705	View looking NE along southeast toe of NHWLF
19		C311_4592	2011-08-16	10315	10717	Panoramic view looking NW to NE across cover from south corner of NWHLF
20		C311_4593	2011-08-16	10306	10721	View looking NW at depression below crest on mid-southwest side of NHWLF (4m L, 2 m W, 5-10cm D) - FEATURE A
21		C311_4594	2011-08-16	10296	10725	View looking SE at depression below crest on mid-southwest side of NHWLF (4m L, 2 m W, 5-10cm D) - FEATURE A
22		C311_4595	2011-08-16	10287	10729	Panoramic view looking NE to SE across cover from west corner of NHWLF
23		C311_4596	2011-08-16	10289	10734	View looking NE at subtle depression on northwest crest (0.5m L, 0.2m W, 5cm D) - FEATURE A
24		C311_4597	2011-08-16	10297	10750	View looking SW at minor depression below crest on northwest side of NHWLF (5m L, 2m W, 2cm) - FEATURE A
25		C311_4598	2011-08-16	10293	10737	View looking SE across cover from northwest crest
26		C311_4599	2011-08-16	10296	10747	View looking SE across cover from northwest crest
27		C311_4600	2011-08-16	10301	10756	View looking NW at minor erosion on northwest slope of NHWLF (12m L, 1m W, 2-3cm D) - FEATURE B
28		C311_4601	2011-08-16	10298	10759	View looking southwest at minor depression on west side slope (0.3m L, 0.2m W, 0.5-0.07m D) - FEATURE B
29		C311_4602	2011-08-16	10286	10763	View looking SE at minor erosion on northwest slope of NHWLF (12m L, 1m W, 2-3cm D) - FEATURE B. Note crack on slope (0.12m L, 1.5cm W) - FEATURE D
30		C311_4603	2011-08-16	10290	10761	View of crack located on northwest side slope (0.12m L, 1.5cm W)

Table IX (Continued): Landfill Visual Inspection Photo Log – NHWLF

31		C311_4605	2011-08-16	10304	10764	Panoramic view looking SE to SW across cover from north corner of NHWLF
32		C311_4606	2011-08-16	10315	10741	Exposed metal debris (bed rail) on surface of landfill cover - FEATURE C
33		C311_4607	2011-08-16	10312	10742	View looking SE at exposed metal debris in center of landfill cover - FEATURE C
34		C311_4608	2011-08-16	10319	10725	View looking NW across cover from southeast crest.
35		C311_4609	2011-08-16	10325	10735	View looking NW across cover from southeast crest. Exposed metal debris visible in center background.
36		C311_4610	2011-08-16	10329	10744	View looking NW across cover from southeast crest.
37		C311_4611	2011-08-16	10344	10750	View looking southwest at minor depression on east side slope (0.4m L, 0.15m W, 0.1m D) - FEATURE A

5 STATION LANDFILL

5.1 BACKGROUND AND MONITORING PROGRAM

The Station Landfill area is located approximately 200 m south of the module train along a bedrock-controlled ridge on the south side of the access road that extends between the airstrip and station areas. The landfill has three separate regrade areas (labelled as Lobes A through C for reference), and, including engineered cover, encompasses a footprint of approximately 11,000 m^2 with the final cover extending approximately 0.75 m to 2.0 m above the surrounding grade. Based on existing information regarding this landfill as a source of contamination, its potential migration pathways and receptors, the Station Landfill was classified as low potential environmental risk. The remediation consisted of excavating surface-contaminated soils, removing large pieces of exposed debris and regrading with the placement of additional granular fill.

The long-term monitoring plan consists of visual monitoring and periodic collection of soil samples. The 2011 monitoring of this landfill includes a visual inspection to assess landfill performance. No instrumentation is installed at this landfill.

5.2 VISUAL INSPECTION REPORT

The visual inspection of the Station Landfill was conducted on August 16, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table X of this report.

Settlement
Indications of settlement were noted at four locations on the northeast crest and one location on the south crest of Lobe B (Feature A) and two isolated locations on the northwest and central surface areas of Lobe C (Feature B). All six areas consisted of relatively small localized depressions on the landfill surface. With the exception of additional small depressions on the northeast crest of Lobe B and central cover of Lobe C, these features appear consistent with the 2010 inspection and have an acceptable severity rating.

Erosion
Four general areas of erosion were noted on the surface or sides of the Station Landfill, including one within a constructed erosion channel extending along the north end of Lobe B (Feature C), several localized areas of shallow erosion across the mid-slope area of Lobe B (Feature D); surface runoff resulting in minor erosion along the south side and west toe of Lobe B (Feature E); and an erosion forming armoured channel along the edge of the west toe (Feature F). Surface runoff in each area has resulted in the washing and redeposition of finer grained materials. Most of erosion features appear to be consistent with the 2010 inspection with the exception of Feature D, which appears to have increased slightly in size and magnitude over the 2010 observations. All features appear to be self-armouring and have an acceptable severity rating.

Frost Action
No evidence of frost action was noted.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
No signs of vegetation were noted on the landfill.

Staining

Minor rust-coloured staining (Feature G) was noted along the east toe of Lobe A. The staining was associated with a former ponded area bordering the east side of the lobe. The staining appears consistent with findings from the 2009 and 2010 inspections. There was no ponding or sheen that could be associated with the staining at the time of the inspection.

Seepage Points

No evidence of specific seepage points was noted.

Debris

One partially exposed piece of metal debris was noted on the south cover of Lobe B (Feature H), consisting of a 15 x 8 cm exposed piece of metal. This feature was not observed during the previous 2010 inspection. There was no other indication of debris at the landfill.

Presence/Condition of Monitoring Instruments

No monitoring instruments are installed at this landfill.

Other Features of Note

Several tension cracks were observed on the surface and/or side slopes of Lobes B and C, including: two areas of semi-continuous single and parallel cracks extending across the southwest cover and crest of Lobes B (Feature I); and parallel cracks extending along the south side slope of Lobe C (Feature J). Feature I on Lobe B appears as a new observation in 2011, whereas cracks associated with Feature J appear to have increased in length and width from the previous 2010 inspection.

Discussion

The Station Landfill performance with respect to containment of the debris within the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawing, is presented in the following pages.

Minor settlement features were noted in isolated areas on the surface of Lobes B and C. It was noted that surface runoff has resulted in minor erosion features on the north and south side of Lobe B and along the west side of Lobe C. Surface runoff upgradient of Lobe B is directed along a drainage channel that extends around the north and southeast ends and is not in direct contact with the lobe. These features appear to be largely consistent with findings from the 2010 inspection and appear to be self armouring along the cross and downgradient slopes. Several new tension cracks were noted across the southwest cover and crest areas of Lobe B, with existing cracks on Lobe C also increasing in size (length and width).

Table X: Visual Inspection Checklist / Report – Station Landfill

DEW LINE CLEANUP: POST-CONSTRUCTION – LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 of 2

SITE NAME: CAM-3 Shepherd Bay
LANDFILL DESIGNATION: Station Landfill (Regrade Landfill)
DATE OF INSPECTION: August 16, 2011
DATE OF PREVIOUS INSPECTION: August 16-17, 2010
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: CAM-3 Shepherd Bay
Landfill: Station Landfill
Designation: Regrade Landfill
Date Inspected: August 16, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature: 

CAM-3 Station Landfill

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure CAM-3.4 (Lobe B - 2 New Obs.)	1 - 2 m	0.5 - 1 m	0.02 - 0.05 m	Occassional	Five small depressions on cover	SLF-28-30	Acceptable	Minor depressions along north crest of lobe.
		FEATURE B See Figure CAM-3.4 (Lobe C - 1 New Obs.)	0.5 - 0.6 m	0.25 - 0.5 m	0.05 - 0.15 m	Isolated	Two small depressions on cover	SLF-62, 63	Acceptable	Isolated depressions/pot hole on northwest and central cover areas of lobe.
Erosion	Yes	FEATURE C See Figure CAM-3.4 (Lobe B, NW corner)	25 m	1 m	0.1 m	Isolated	Erosion along runoff channel located on northwest corner	SLF-33, 34	N/A	Erosion confined to constructed runoff channel extending around north end of lobe. Channel not in contact with lobe. Appears to be self armouring.
		FEATURE D See Figure CAM-3.4 (Lobe B, mid-slope - 1 New Obs.)	12 - 24 m	0.2 - 2 m	0.01 - 0.05 m	Occassional	Erosion on landfill surface - mid-slope	SLF-37, 38, 46-49	Acceptable	Minor erosion on landfill surface due to channelling of surface runoff. Cover appears stable and self armouring.
		FEATURE E See Figure CAM-3.4 (Lobe B, S sideslope)	12-26 m	0.2-2 m	0.03 - 0.1 m	Occassional	Erosion along south sideslope and east toe	SLF-14, 15, 18-21, 25	Acceptable	Minor erosion at four locations on south sideslope. Minor washing of fines. Appears to be self armouring. Channel on east toe not in contact with lobe.
		FEATURE F See Figure CAM-3.4 (Lobe C, W side)	30 m	0.6 m	5 - 10 cm	Isolated	Erosion along west toe	SLF-51, 52	Acceptable	Erosion forming armoured channel along edge of west toe. Not in contact with lobe.
Frost Action	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Vegetation	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Staining	Yes	FEATURE G See Figure CAM-3.4 (Lobe A)	15 m	1 m	N/A	Isolated	Minor staining along east toe	SLF-4, 5, 6	Acceptable	Localized rust coloured staining at the toe of slope. No ponding or sheen observed.
Vegetation Stress	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Debris Exposed	Yes	FEATURE H See Figure CAM-3.4 (Lobe B , S slope - New Obs.)	0.15 m	0.08 m	Unknown	Isolated	Partially exposed metal debris	SLF-16, 17	Acceptable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Other Features of Note:	Yes	FEATURE I See Figure CAM-3.4 (Lobe B, S cover/crest - New Obs.)	2 - 25 m	3 - 5 mm	Unknown	Occassional	Parallel and single cracks on south side slope	SLF-11, 12, 40-44	Acceptable	Tension/desiccation cracks. Not observed in 2010.
		FEATURE J See Figure CAM-3.4 (Lobe C)	8 m	2 - 5 mm	Unknown	Isolated	Parallel cracks on south side slope	SLF-55, 56, 57	Acceptable	Appears to have increased slightly in length and width from 2010.
Additional Photos	Yes	See Figure CAM-3.4 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

5.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for Station Landfill has been completed as per the ToR and is included as Table XI hereafter.

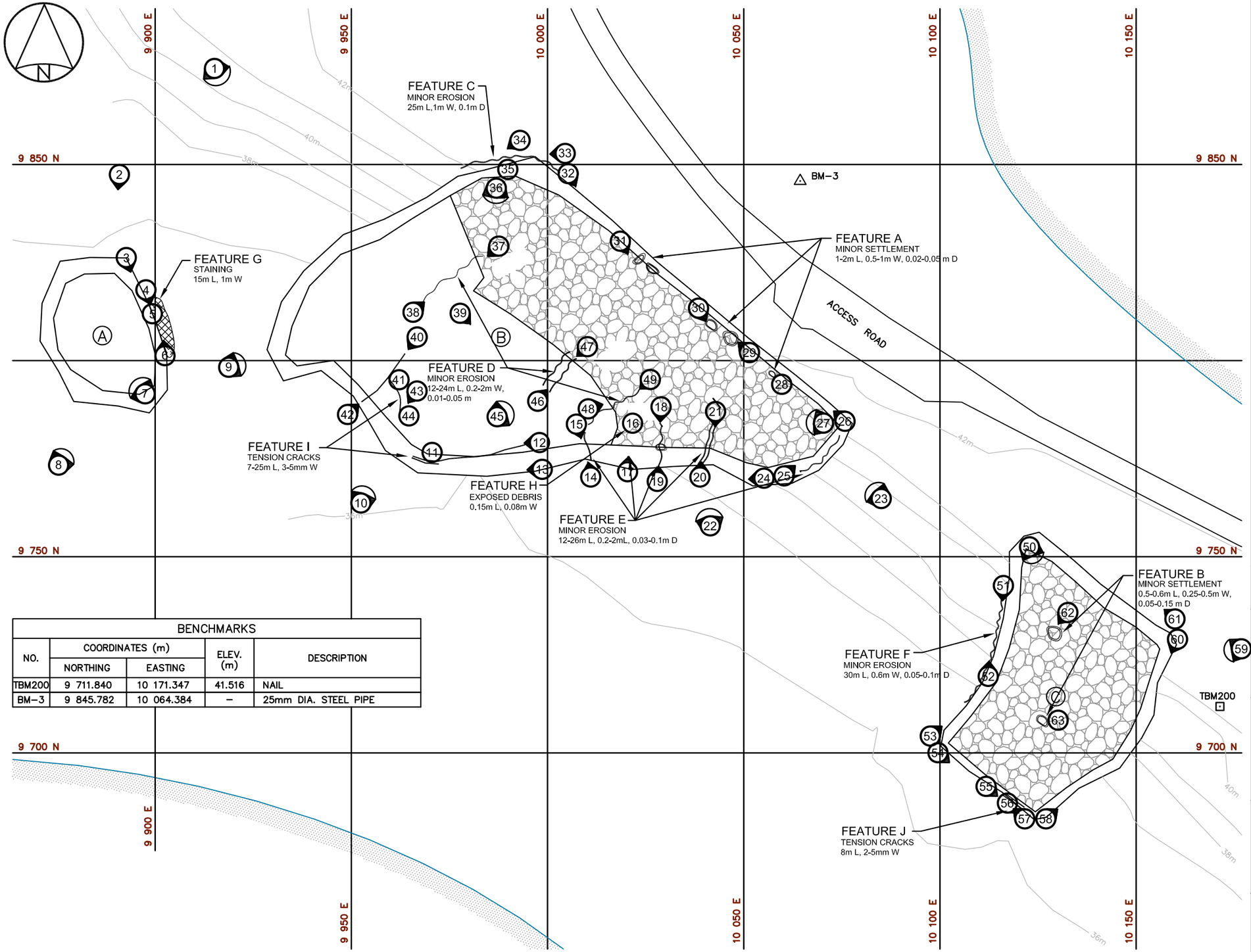
Table XI: Preliminary Stability Assessment – Station Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

5.4 LOCATION PLAN

The Location Plan for the Station Landfill has been completed as per the ToR and is presented in Figure CAM-3.4.



LEGEND

- CM27 — SURVEY CONTROL MONUMENT
- TBM208 — TEMPORARY BENCHMARK
- 26 — PICTURE NUMBER VIEWPOINT
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (NTS)
- STAINING (NTS)

0 10m 20m 30m 40m 50m

BENCHMARKS

NO.	COORDINATES (m)		ELEV. (m)	DESCRIPTION
	NORTHING	EASTING		
TBM200	9 711.840	10 171.347	41.516	NAIL
BM–3	9 845.782	10 064.384	–	25mm DIA. STEEL PIPE

NO.	VERSION	DATE	P.L.	A.P.	P.G.
A	FINAL	12–01–26	PAR	VERIF.	APPR.

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FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

STATION LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone: (418) 653-4422 Fax.: (418) 653-3583

MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	JANUARY 2012
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS
PROJECT NO: CD9229_002_160	DRAWING NO: CD9229_003_160-CAM-3_4	PAGE PL

FIGURE CAM-3.4

5.5 PHOTOGRAPHIC RECORDS

The Photographic Record for Station Landfill has been completed as per the ToR and is included as Table XII hereafter. The Photographic Record contains only an index and “thumbnail” photographs. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XII: Landfill Visual Inspection Photo Log – Station Landfill

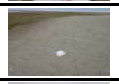
Photo (SLF-)	Thumbnail	Filename	Date	Vantage Point		Caption
				Easting	Northing	
Lobe A						
1		C311_4502	2011-08-16	9915	9874	Panoramic view looking E to SW at Lobes A and B
2		C311_4503	2011-08-16	9891	9848	View looking S from north of Lobe A
3		C311_4504	2011-08-16	9893	9827	View looking SSE along east toe of Lobe A.
4		C311_4505	2011-08-16	9898	9818	View looking SSE along east toe of Lobe A. Note rust coloured staining along edge of granular cover - FEATURE G
5		C311_4506	2011-08-16	9899	9812	Rust coloured staining in low lying areas along east toe of Lobe A - FEATURE G
6		C311_4507	2011-08-16	9903	9801	View looking N along east toe of Lobe A. Note rust coloured staining along edge of granular cover.
7		C311_4508	2011-08-16	9897	9792	Panoramic view looking W to NE across surface from south end of Lobe A
8		C311_4509	2011-08-16	9875	9773	Panoramic view looking N to W from south of Lobe A
Lobe B						
9		C311_4510	2011-08-16	9918	9798	Panoramic view looking NE to SE from southwest of Lobe B
10		C311_4511	2011-08-16	9953	9763	Panoramic view looking NW to NE from south of Lobe B
11		C311_4513	2011-08-16	9971	9776	View of parallel tension cracks located on south toe of Lobe B (7-25m L, 1-3mm W) - FEATURE I
12		C311_4514	2011-08-16	9998	9779	View looking west at crack extending along south side of Lobe B (25m L, 1-3mm W) - FEATURE I
13		C311_4515	2011-08-16	9999	9772	View looking W along south toe of Lobe B. No ponded water as previously noted in 2010.
14		C311_4516	2011-08-16	10012	9771	View looking NW at erosion on southeast slope of Lobe B (5m L, 0.6m W, 0.05m D) - FEATURE E

Table XII (Continued): Landfill Visual Inspection Photo Log – Station Landfill

15		C311_4517	2011-08-16	10007	9783	View looking SE at erosion on southeast slope of Lobe B (5m L, 0.6m W, 0.05m D) - FEATURE E
16		C311_4518	2011-08-16	10022	9784	View of partially exposed metal debris on south side of Lobe B (0.15m L, 0.08m W) - FEATURE H
17		C311_4519	2011-08-16	10021	9772	View looking N at partially exposed metal debris on south side of Lobe B (0.15m L, 0.08m W) - FEATURE H
18		C311_4520	2011-08-16	10029	9788	View looking S at minor eroson on south side slope of Lobe B (11m L, 0.3m W, 0.05m D) - FEATURE E
19		C311_4521	2011-08-16	10028	9769	View looking N at minor eroson on south side slope of Lobe B (11m L, 0.3m W, 0.05m D) - FEATURE E
20		C311_4522	2011-08-16	10039	9770	View looking N at minor erosion on south slope of Lobe B (12m L, 0.2-2m W, 0.1m D) - FEATURE E
21		C311_4523	2011-08-16	10043	9787	View looking S at minor erosion on south slope of Lobe B (12m L, 0.2-2m W, 0.1m D) - FEATURE E
22		C311_4524	2011-08-16	10040	9758	Panoramic view looking WNW to NE from southeast of Lobe B
23		C311_4525	2011-08-16	10085	9764	Panoramic view looking W to N from east of Lobe B
24		C311_4526	2011-08-16	10056	9770	View looking W along southeast side slope of Lobe B
25		C311_4527	2011-08-16	10061	9770	View looking NE along southeast side slope of Lobe B. Note minor washing of fines along toe (20m L, 0.5m W, 0.01-0.03m D) - FEATURE E
26		C311_4528	2011-08-16	10076	9784	View looking NW along north toe from northeast corner of Lobe B.
27		C311_4529	2011-08-16	10071	9784	Panoramic view looking SW to NW from southeast corner of Lobe B
28		C311_4530	2011-08-16	10060	9794	View of minor depresson on northeast side of Lobe B (0.7m L, 0.7m W, 10cm D) - FEATURE A
29		C311_4531	2011-08-16	10051	9802	View looking NW at minor depression near north crest of Lobe B (1.5-2m L, 1m W, 10-15cm D) - FEATURE A
30		C311_4532	2011-08-16	10039	9812	View looking SE at minor depression near north crest of Lobe B (1.5-2m L, 1m W, 10-15cm D) - FEATURE A

Table XII (Continued): Landfill Visual Inspection Photo Log – Station Landfill

31		C311_4534	2011-08-16	10019	9830	View looking SE at minor depression near north crest of Lobe B (1.5-2m L, 0.4m W, 10cm D) - FEATURE A
32		C311_4535	2011-08-16	10005	9848	View looking SE along north toe of Lobe B
33		C311_4536	2011-08-16	10004	9853	View looking W along dry drainage feature located on northwest corner of Lobe B - FEATURE C
34		C311_4537	2011-08-16	9994	9855	View looking SW along dry drainage feature located on northwest corner of Lobe B - FEATURE C
35		C311_4538	2011-08-16	9990	9849	Piece of exposed wood debris on south slope of drainage channel on northwest corner of Lobe B
36		C311_4539	2011-08-16	9988	9845	Panoramic view looking SE to SW across Lobe B from northwest corner
37		C311_4541	2011-08-16	9988	9830	View looking SW along minor erosion on surface of Lobe B (24m L, 0.2-0.4m W, 1-3cm D) - FEATURE D
38		C311_4542	2011-08-16	9965	9812	View looking NE along minor erosion on surface of Lobe B (24m L, 0.2-0.4m W, 1-3cm D) - FEATURE D
39		C311_4543	2011-08-16	9978	9812	View looking SE along toe of mid-slope break on Lobe B
40		C311_4544	2011-08-16	9967	9806	View looking SW at crack extending across southwest cover of Lobe B (25m L, 3-5mm W) - FEATURE I
41		C311_4545	2011-08-16	9962	9795	View of crack extending across southwest cover of Lobe B (25m L, 3-5mm W) - FEATURE I
42		C311_4546	2011-08-16	9949	9786	View looking NE at crack extending across southwest cover of Lobe B (25m L, 3-5mm W) - FEATURE I
43		C311_4547	2011-08-16	9966	9792	View looking SW at cracks extending across southwest cover of Lobe B (25m L, 3-5mm W) - FEATURE I
44		C311_4548	2011-08-16	9964	9787	View of crack on southwest cover of Lobe B (25m L, 3-5mm W) - FEATURE H
45		C311_4549	2011-08-16	9987	9786	Panoramic view looking N to SE at mid-slope on Lobe B

Table XII (Continued): Landfill Visual Inspection Photo Log – Station Landfill

46		C311_4550	2011-08-16	9998	9789	View looking NE along parallel minor erosion features on surface of Lobe B (20m L, 0.3-1m W, 1-3cm D) - FEATURE D
47		C311_4552	2011-08-16	10010	9803	View looking SW along parallel minor erosion features on surface of Lobe B (20m L, 0.3-1m W, 1-3cm D) - FEATURE D
48		C311_4554	2011-08-16	10010	9787	View looking NE at minor erosion on mid-slope on south side of Lobe B (15m L, 0.5-3m W, 3-5cm D) - FEATURE D
49		C311_4555	2011-08-16	10026	9795	View looking SW at minor erosion on mid-slope on south side of Lobe B (15m L, 0.5-3m W, 3-5cm D) - FEATURE D
Lobe C						
50		C311_4556	2011-08-16	10123	9752	Panoramic View looking SE to SW across surface from northwest corner of Lobe B
51		C311_4557	2011-08-16	10116	9743	View looking S along drainage feature (dry) extending along west toe from northwest side of Lobe C - FEATURE F
52		C311_4558	2011-08-16	10113	9719	View looking N along drainage feature (dry) extending along west toe from northwest side of Lobe C - FEATURE F
53		C311_4559	2011-08-16	10098	9703	View looking NE along west toe of Lobe C
54		C311_4560	2011-08-16	10099	9701	View looking SE along south toe of Lobe C
55		C311_4561	2011-08-16	10111	9691	View looking SE at location of cracks on south side slope of Lobe C (8m L, 2-5mm W) - FEATURE J
56		C311_4562	2011-08-16	10118	9687	Parallel cracks on south side slope of Lobe C (8m L, 2-5mm W) - FEATURE J
57		C311_4563	2011-08-16	10123	9683	View looking NW along south toe from southeast corner of Lobe C
58		C311_4565	2011-08-16	10125	9683	View looking NE along east toe of Lobe C
59		C311_4567	2011-08-16	10176	9727	Panoramic view looking SW to NW from northeast of Lobe C
60		C311_4568	2011-08-16	10160	9729	View looking SW along north toe from northeast corner of Lobe C

Table XII (Continued): Landfill Visual Inspection Photo Log – Station Landfill

61		C311_4569	2011-08-16	10159	9733	View looking NW along north toe from northeast corner of Lobe C
62		C311_4570	2011-08-16	10133	9736	View looking SW at minor depression on northwest area of cover (0.5m L, 0.5m W, 15cm D) - FEATURE B
63		C311_4571	2011-08-16	10129	9708	View of minor depression on central cover of Lobe C (0.6m L, 0.25m W, 5-7cm D) - FEATURE B

6 TIER II DISPOSAL FACILITY

6.1 BACKGROUND AND MONITORING PROGRAM

The Tier II Disposal Facility is constructed on the south side of the U-shaped ridge that extends between the airstrip and station areas. The facility is situated approximately 175 m southeast of the Station Landfill and 225 m southwest of the south end of the airstrip. The landfill was constructed with a double containment system consisting of a geomembrane liner system and the placement of sufficient surface fill to promote freezing of the landfill contents.

The facility encompasses a footprint of approximately 5,500 m^2 with the final cover extending between 4-5 m above the surrounding grade.

Four groundwater monitoring wells are installed at the landfill perimeter, and four thermistors are installed within the landfill footprint to monitor freeze back conditions.

The long-term monitoring plan consists in visual monitoring, collection of soil and groundwater samples and monitoring of subsurface ground temperatures.

The 2011 monitoring of this landfill includes visual inspection to verify for evidence of settlement or erosion, collection of soil and groundwater samples to monitor for the presence of leachate and retrieval of data from the thermistors. Locations of groundwater monitoring wells, soil samples and thermistor installations are identified on Figure CAM-3.5.

Soil at all stations was sampled as specified. Each of the wells was monitored for groundwater as per the ToR. Dry conditions were noted at all monitoring well locations, with the exception of MW-7 which was sampled and analyzed as per the ToR.

6.2 VISUAL INSPECTION REPORT

The visual inspection of the Tier II Disposal Facility was conducted on August 15, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table XIII of this report.

Settlement

Indications of minor settlement were noted at several locations along the cover, crests and side slopes of the facility, including: four small depressions on the northwest crest, north cover and northeast side slope and toe (Feature A); three small oval-shaped depressions on the southwest crest and side slope below VT-8 (Feature B); two small oval-shaped depressions on the southeast side slope (Feature C); and two relatively wide concave depressions along the toe of slope on the south side of the facility (Feature D). Both Feature D depressions are associated with surface erosion features and cracking (linear and radial) located within the bottom 2 to 3 m of the south toe.

With the exception of one localized depression on the north cover and the two large depressions along the south toe, all observed features appear relatively unchanged from the previous 2010 inspection. All features have an acceptable severity rating.

Erosion
Evidence of minor surface erosion was noted at four locations on the west facing slope (Feature E) and south facing slope (Feature F) of the facility. All locations consisted of shallow surface erosion that extended perpendicular to the slope with most of them extending from crest to toe.

Most erosion features appear consistent with observations made during the previous 2010 inspection, with the exception of one newly identified area near the northwest crest and a slight increase in depth of erosion on the southwest and south sides of the facility.

The areas affected appear to be self-armouring and have an acceptable severity rating. Overall, the facility cover appears stable.

Frost Action
No indications of frost action were noted. Please see Other Features of Note below.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
No indications of vegetation were noted.

Staining
No areas of staining were observed at the time of the inspection.

Seepage Points
No evidence of seepage was noted

Debris
No evidence of exposed debris was noted.

Presence/Condition of Monitoring Instruments
All monitoring well and thermistor installations were found to be in good condition at the facility.

Other Features of Note
Numerous thin to moderate tension cracks were noted extending parallel to the slope and within the bottom 8 m on the southwest, south and southeast side slopes of the facility (Feature G). Concave cracks were also noted near the two large bowl shaped depressions situated on the south toe (Feature D). The frequency and magnitude of cracks appear to have increased from the previous 2010 inspection, with the most significant cracks noted on the southwest and southeast corners of the facility (up to 60 mm wide and 50 cm deep). Numerous cracks were also concentrated in the vicinity of the shallow erosion and settlement features in the low to mid slope area along the south facing side and along the southwest corner of the facility.

Discussion
The Tier II Disposal Facility performance with respect to containment of the debris within the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawing, is presented in the following pages.

An increase in the frequency and magnitude of in cracks was observed along the downgradient side of the facility from the previous 2009 and 2010 inspections.

Table XIII: Visual Inspection Checklist / Report – Tier II Disposal Facility

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 of 2

SITE NAME: CAM-3 Shepherd Bay
LANDFILL DESIGNATION: Tier II Disposal Facility (New Landfill)
DATE OF INSPECTION: August 15, 2011
DATE OF PREVIOUS INSPECTION: August 16-17, 2011
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: CAM-3 Shepherd Bay
Landfill: TIER II Disposal
Designation: New Landfill
Date Inspected: August 15, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature: 

CAM-3 TIER II DISPOSAL FACILITY

Checklist Item	Present (Yes/No)		Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATUREA See Figure CAM-3.5 (north side) - 1 New Obs.	0.8 - 2 m	0.1 - 0.5 m	2 - 10 cm	Occassional	Minor surface depressions	Tier II-18, 46, 47, 50	Acceptable	Minor depressions on north cover, northeast side slope and northeast toe. New Obs. on north cover area
		FEATURE B See Figure CAM-3.5 (southwest corner)	0.5 - 0.8 m	0.3 - 0.4 m	10 cm		Minor surface depressions	Tier II-38, 39	Acceptable	Minor depressions on southwest slope and crest
		FEATURE C See Figure CAM-3.5 (southeast corner)	1 - 3 m	0.2 - 0.4 m	5 - 10 cm		Minor surface depressions	Tier II-42, 44	Acceptable	Minor depressions on southeast slope.
		FEATURE D See Figure CAM-3.5 (south toe) - New Obs.	10 - 12 m	2 - 3 m	10 - 40 cm		Parabolic surface depressions at toe	Tier II-2-4, 12, 58, 60, 63	Acceptable	Extensive cracks noted within and immediately upslope of depressions. Depressions appear to be associated with erosional features on south side slope
Erosion	Yes	FEATURE E See Figure CAM-3.5 (west side) - 1 New Obs.	3 - 20 m	0.2 -0.5 m	2 - 7 cm	Occassional	Minor surface erosion	Tier II-28, 33, 51	Acceptable	Two areas of minor erosion noted along west facing slope. Slope appears stable and self armouring.
		FEATURE F See Figure CAM-3.5 (south side)	25 m	0.3 - 2 m	5 - 7 cm		Minor surface erosion	Tier II-1, 37, 40	Acceptable	Two areas of minor erosion noted along south facing slope. Slope appears stable and self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Vegetation	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Staining	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Presence/Condition of Monitoring Instruments	Yes	See Figure CAM 3.5	N/A	N/A	N/A	N/A	VT-5 to -8 MW-4 to -7	Tier II-45, 49, 41, 35 MW-5W, 6W, 7W, 8W	Acceptable	Ground temperature cables and data loggers were in good condition and all data was downloaded. Monitoring well pipe heaving at MW-5.
Other Features of Note:	Yes	FEATURE G See Figure CAM-3.5 (west, south and east sides) Some New Obs.	2 - 40 m (Varies)	2 - 60 mm	50cm+ on southwest corner and 30cm+ on southeast corner	Numerous	Numerous tension cracks	Tier II-2-4, 29-32,52-63	Acceptable	Tension cracks approximately 2-15 mm wide extending parallel to south, west and east facing slopes. Some radial cracks at Feature D. Majority of cracks extend between 2-6 m of base of slope with few cracks up to 8 m above toe of slope. Some infilling. Frequency and mangnitude appears to have increased from 2010 observations. Largest cracks observed on southwest and southeast corners of facility.
Additional Photos	Yes	See Figure CAM-3.5 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

6.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the Tier II Disposal Facility has been completed as per the ToR and is included as Table XIV hereafter.

Table XIV: Preliminary Stability Assessment – Tier II Disposal Facility

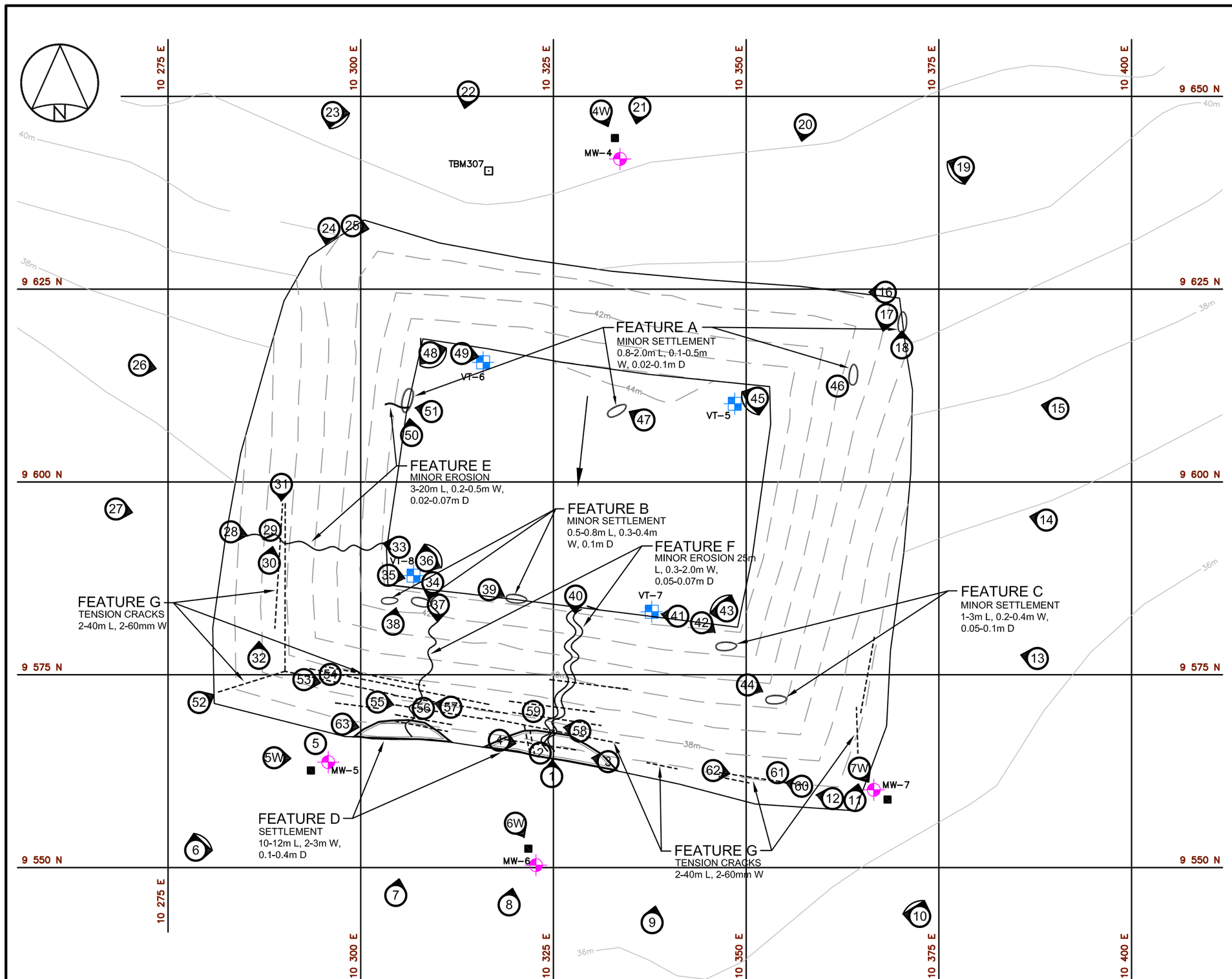
Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

6.4 LOCATION PLAN

The Location Plan for the Tier II Disposal Facility has been completed as per the ToR and is included in the following page as Figure CAM-3.5.



LEGEND

- TBM20 — TEMPORARY BENCHMARK
- MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION
- 15 — PICTURE NUMBER VIEWPOINT
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (NTS)

0 5m 10m 15m 20m 25m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
A	FINAL	12-01-26	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

TIER II DISPOSAL FACILITY

SITE REMEDIATION SOLUTIONS

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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 500	JANUARY 2012
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS
PROJECT NO: CD9229_002_160	DRAWING NO: CD9229_002_160-CAM-3_5	PAGE PL

FIGURE CAM-3.5

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6.5 PHOTOGRAPHIC RECORDS

The Photographic Record for the Tier II Disposal Facility has been completed as per the ToR and is included as Table XV hereafter. The Photographic Record contains only an index and “thumbnail” photographs. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XV: Landfill Visual Inspection Photo Log – Tier II Disposal Facility

Photo (Tier II-)	Thumbnails	Filename	Date	Vantage Point		Caption
				Easting	Northing	
General						
1		C311_4419	2011-08-15	10325	9563	View looking N at minor erosion on south slope (25m L, 2m W, 5-7cm D) - FEATURE F
2		C311_4420	2011-08-15	10324	9565	View of radial cracking within depression near toe on south side of Tier II DF (5-20mm W) - FEATURE D
3		C311_4421	2011-08-15	10330	9564	View looking W at cracking within depression near toe on south side of Tier II DF (5-20mm W) - FEATURE D
4		C311_4422	2011-08-15	10319	9566	View looking E at cracking near toe on south side of Tier II DF (5-20mm W) - FEATURE D
5		C311_4425	2011-08-15	10294	9566	View of C3-5W located southwest of Tier II DF. Note protective cover raised off as a result of well heaving.
6		C311_4428	2011-08-15	10279	9552	Panoramic view looking N to E from southwest of Tier II DF.
7		C311_4429	2011-08-15	10305	9547	View looking NNE at south side of facility. VT-8 visible in center.
8		C311_4430	2011-08-15	10320	9545	View looking NNE at south side of facility. VT-8 visible on left and VT-7 in center.
9		C311_4431	2011-08-15	10339	9544	View looking NNE at south side of facility. VT-7 visible in centre.
10		C311_4432	2011-08-15	10374	9544	Panoramic view looking W to N from southeast of Tier II DF
11		C311_4433	2011-08-15	10363	9560	View looking N along east toe of Tier II DF.
12		C311_4434	2011-08-15	10363	9560	View looking W along south toe of Tier II DF. Note minor vegetation on southeast corner of slope.
13		C311_4435	2011-08-15	10388	9577	View looking W at southeast corner of facility. VT-5 visible on far right
14		C311_4436	2011-08-15	10390	9595	View looking W at east side of Tier II DF. VT-5 visible on right.
15		C311_4437	2011-08-15	10390	9610	View looking W at northeast corner of Tier II DF. VT-5 visible in center.

Table XV (Continued): Landfill Visual Inspection Photo Log – Tier II Disposal Facility

16		C311_4438	2011-08-15	10368	9624	View looking W along north toe of Tier II DF
17		C311_4439	2011-08-15	10368	9622	View looking S along east toe of Tier II DF
18		C311_4440	2011-08-15	10370	9617	View looking N at depresson on northeast toe of Tier II DF (0.8m L, 0.4m W, 10cm D) - FEATURE A
19		C311_4441	2011-08-15	10378	9641	Panoramic view looking S to W from northeast of Tier II DF
20		C311_4442	2011-08-15	10358	9647	View looking S at northeast side of facility. VT-5 visible in center
21		C311_4443	2011-08-15	10336	9649	View looking S at north side of facility. MW-4 visible in foreground, VT-5 visible on left and VT-6 on right.
22		C311_4445	2011-08-15	10314	9651	View looking S at north side of facility. VT-6 visible right of center.
23		C311_4446	2011-08-15	10296	9649	Panoramic view looking E to S from northwest of Tier II DF. VT-6 visible in center.
24		C311_4447	2011-08-15	10297	9633	View looking S along west toe from northwest corner of facility
25		C311_4448	2011-08-15	10298	9633	View looking E along north toe from northwest corner of facility
26		C311_4449	2011-08-15	10271	9615	View looking ES at west side of facility. VT-6 visible on left and VT-8 on right.
27		C311_4451	2011-08-15	10268	9596	View looking ES at south side of facility. VT-8 visible in center.
28		C311_4452	2011-08-15	10287	9593	View looking E at minor erosion on west slope of facility (20m L, 0.15-0.2m W, 5-7cm D) - FEATURE E
29		C311_4455	2011-08-15	10289	9593	View of crack extending along west side slope of Tier II DF (5m L, 3-15mm W) - FEATURE G
30		C311_4456	2011-08-15	10288	9589	View looking N at cracks extending along west side slope of Tier II DF (5m L, 3-15mm W) - FEATURE G

Table XV (Continued): Landfill Visual Inspection Photo Log – Tier II Disposal Facility

31		C311_4458	2011-08-15	10289	9600	View looking S at cracks extending along west side slope of Tier II DF (5m L, 3-15mm W) - FEATURE G
32		C311_4459	2011-08-15	10287	9577	View looking N at crack extending along west side slope of Tier II DF (5m L, 3-15mm W) - FEATURE G
33		C311_4460	2011-08-15	10305	9592	View looking W at minor erosion on west slope of facility (20m L, 0.15-0.2m W, 5-7cm D) - FEATURE E
34		C311_4461	2011-08-15	10309	9587	View looking SSW at minor depression below crest on southwest corner of facility (2m L, 0.5m W, 5cm D) - FEATURE B
35		C311_4463	2011-08-15	10304	9588	View looking E at VT-8 located on southwest corner of Tier II DF. VT-7 visible in background.
36		C311_4464	2011-08-15	10308	9589	Panoramic view looking N to ESE across surface from southwest corner of facility.
37		C311_4465	2011-08-15	10310	9584	View looking S at minor erosion on south side slope of facility (25m L, 0.3m W, 5cm D) - FEATURE F
38		C311_4466	2011-08-15	10304	9581	View looking N at minor depression below crest on southwest corner of facility (0.5m L, 0.3m W, 10cm D) - FEATURE B
39		C311_4467	2011-08-15	10317	9586	View looking ESE at pothole depression on south crest of facility (0.8m L, 0.4m W, 10cm D) - FEATURE B
40		C311_4468	2011-08-15	10328	9584	View looking S at 2 areas of minor erosion on south side slope of facility (25m L, 0.5m W, 5cm D) - FEATURE F
41		C311_4469	2011-08-15	10341	9583	View looking W at VT-7, VT-8 visible in background.
42		C311_4470	2011-08-15	10344	9581	View looking SE at minor depression on slope 4 m below southeast corner of facility (1m L, 0.4m W, 10cm D) - FEATURE C
43		C311_4471	2011-08-15	10348	9583	Panoramic view looking W to N across surface from southeast corner of facility
44		C311_4473	2011-08-15	10350	9573	View looking SE at tire tracks on southeast slope of facility (3m L, 0.2m W, 5-10cm D) - FEATURE C
45		C311_4474	2011-08-15	10351	9611	Panoramic view looking S to W across surface from northeast corner of Tier II DF. VT-5 visible in foreground.

Table XV (Continued): Landfill Visual Inspection Photo Log – Tier II Disposal Facility

46		C311_4476	2011-08-15	10362	9613	Minor depression on northeast slope (0.8m L, 0.1-0.3m W, 5cm D) - FEATURE A
47		C311_4477	2011-08-15	10336	9608	View looking northwest at minor depression on north side of cover (0.5m L, 0.3m W, 5-7cm D) - FEATURE A
48		C311_4478	2011-08-15	10309	9617	Panoramic view looking SW to SE across surface from northwest corner of facility.
49		C311_4479	2011-08-15	10313	9617	View looking E at VT-6 located on northwest corner of Tier II DF. VT-5 visible in background.
50		C311_4480	2011-08-15	10306	9606	View looking N at minor depression (2m L, 0.5m W, 2-5cm D) extending along crest on northwest corner of Tier II DF - FEATURE A
51		C311_4481	2011-08-15	10309	9610	View looking W at minor erosion on west side slope of facility (3m L, 0.2m W, 2-3cm D) - FEATURE E
52		C311_4482	2011-08-15	10281	9572	View looking NE at cracks on southwest corner of facility (1-3cm W) - FEATURE G
53		C311_4483	2011-08-15	10293	9575	View looking E at tension cracks extending from southwest corner on south slope (1-3cm W) - FEATURE G and large depressions near toe in background - FEATURE D
54		C311_4484	2011-08-15	10296	9575	View of tension cracks extending along south slope (1-3cm W) - FEATURE G
55		C311_4485	2011-08-15	10302	9571	View looking E at numerous cracks extending along south slope at 0.5-1m intervals - FEATURE G
56		C311_4486	2011-08-15	10307	9571	View of 50 cm deep crack on south slope of facility - FEATURE G
57		C311_4487	2011-08-15	10311	9571	View looking W at numerous cracks extending along south slope at 0.5-1m intervals - FEATURE G
58		C311_4489	2011-08-15	10329	9568	View looking W at numerous cracks extending along south slope at 0.5-1m intervals - FEATURE G. Also note depressions near toe on upper right of photo - FEATURE D
59		C311_4490	2011-08-15	10322	9570	View of tension crack mid way along south side slope - FEATURE G
60		C311_4491	2011-08-15	10357	9561	View looking W at numerous cracks extending along south slope toe - FEATURE G

Table XV (Continued): Landfill Visual Inspection Photo Log – Tier II Disposal Facility

61		C311_4492	2011-08-15	10353	9562	View of 30+ cm deep crack on south slope of facility - FEATURE G
62		C311_4493	2011-08-15	10346	9563	View looking E at tension crack extending along toe on southeast corner of facility - FEATURE G
63		C311_4494	2011-08-15	10298	9569	View looking E at large depressions along toe of south side slope - FEATURE D
Soil Sampling						
MW-4		C311_4410	2011-08-15	10333	9644	Sampling location C311-4W located upgradient of Tier II DF
4W		C311_4411	2011-08-15	10331	9648	View SSE at C3-4W soil sample location
MW-5		C311_4426	2011-08-15	10294	9563	View of C311-5W soil sample location
5W		C311_4427	2011-08-15	10289	9564	View looking E at C3-5W
6W		C311_4424	2011-08-15	10322	9552	View looking SE at C311-6W
MW-6		C311_4423	2011-08-15	10321	9556	View of C311-6W soil sample location
MW-7		C311_4412	2011-08-15	10368	9559	View looking SE at C3-7W

6.6 THERMAL MONITORING DATA

All thermistors at the Tier II Disposal Facility were inspected and found to be in good condition with no significant concerns identified. Data from all thermistors was successfully retrieved with the exception of VT-6 where all communication attempts failed due to extremely low battery levels and consequently no temperature data was recorded for the 2010-2011 period. All analogues/thermocouples were observed to be functioning properly at the time of the inspection. Where possible, internal memories were reset and clocks were synchronized using the Prolog software. Good battery levels were noted at the remaining three datalogger units VT-5, VT-7 and VT-8.

6.7 LANDFILL TEMPERATURE DATA FROM DATALOGGERS

Manual resistive and temperature data readings were collected from the thermistor strings as per the ToR. Manual readings and inspection results for each thermistor are presented on the Thermistor Annual Maintenance Reports included in the report. A datalogger RAW data set for VT's-5, 7 and 8 for the 2010-2011 period was forwarded to DCC as per the ToR.

6.8 SOIL SAMPLE ANALYTICAL DATA

The soil chemical analysis results and the evaluation of analytical data for the 2011 Tier II Disposal Facility samples are presented in Tables XVI and XVII below. Field and inter-laboratory duplicates collected as part of the QA/QC program are presented in Appendix C at the end of this report.

Table XVI: Soil Chemical Analysis Results – Metals and PCBs – Tier II Disposal Facility

Sample Name	Location	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]
C311-4WA	MW-4	0-15	<5	7	3	<0.1	4	<10	11	4	0.06	<0.010
C311-4WB		40-50	<5	8	3	<0.1	5	<10	17	4	<0.05	<0.010
C311-5WA + Inter QA	MW-5	0-15	6	10	4	<0.1	6	<10	18	3	<0.05	<0.010
C311-5WB		40-50	6	10	4	<0.1	7	<10	19	3	<0.05	<0.010
C311-BD2 (5WA)		0-15	6	11	4	<0.1	7	<10	19	3	<0.05	<0.010
C311-6WA	MW-6	0-15	<5	8	4	<0.1	6	<10	15	4	<0.05	<0.010
C311-6WB		40-50	<5	8	3	<0.1	6	<10	16	4	<0.05	<0.010
C311-7WA	MW-7	0-15	<5	8	3	<0.1	5	11	13	3	<0.05	<0.010
C311-7WB		40-50	<5	9	4	<0.1	6	<10	16	3	<0.05	<0.010

S/P/CD/9229/CAM-3/2011/T/Tier II Soil.xls

Table XVII: Soil Chemical Analysis Results – PHCs and BTEX – Tier II Disposal Facility

Sample Name	Sample Location	Depth Below Grade [cm]	Parameters						
			Benzene [mg/kg]	Toluene [mg/kg]	Ethylbenzene [mg/kg]	Xylenes [mg/kg]	PHC(F1) [mg/kg]	PHC(F2) [mg/kg]	PHC(F3) [mg/kg]
C311-4WA	MW-4	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-4WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-5WA + Inter QA	MW-5	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-5WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-BD2 (5WA)		0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-6WA	MW-6	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-6WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-7WA	MW-7	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-7WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10

PHC (F1): Petroleum hydrocarbon C_6 to C_{10}, does not include BTEX fractions
PHC (F2): Petroleum hydrocarbon $C_{>10}$ to C_{16}
PHC (F3): Petroleum hydrocarbon $C_{>16}$ to C_{34}

S/P/CD/9229/CAM-1/2011/T/Analysis.xls

Table XVIII: Evaluation of 2011 Soil Analytical Data – Tier II Disposal Facility

Parameter	2011
Copper	Concentrations ranged between <5-6 mg/kg with detectable concentrations noted at downgradient sample location MW-5 only (surface and at depth).
Nickel	Concentrations ranged between 7-10 mg/kg with a mean of 8.5. The most elevated concentrations were observed at surface and depth in MW-5 (10 mg/kg) and at depth in MW-7 (9 mg/kg), both downgradient locations. Detectable concentrations at all other locations ranging between 7-8 mg/kg.
Cobalt	Concentrations ranged between 3-4 mg/kg with a mean of 3.5. The most elevated concentrations were observed at surface and depth in MW-5, surface in MW-6 and at depth in MW-7 (all downgradient locations). Detectable concentrations of 3 mg/kg were noted at all other sample locations.
Cadmium	All reported concentrations were less than the method detection limit (0.1 mg/kg).
Lead	Concentrations ranged between 4-7 mg/kg with a mean of 5.6. Detectable concentrations were observed at all locations with higher concentrations noted at surface and depth at MW-5 and MW-6 and depth at MW-7 (all downgradient locations). Detectable concentrations at all other locations ranged between 4-5 mg/kg.
Zinc	Concentrations ranged between <10-11 mg/kg with detectable concentrations noted at downgradient surface sample location MW-7 only.
Chromium	Concentrations ranged between 11-19 mg/kg with a mean of 15.6. Elevated concentrations of 18 and 19 mg/kg were observed at surface and depth at downgradient location MW-5, respectively. Slightly elevated concentrations were also noted at depth at upgradient location MW-4 (17 mg/kg) and downgradient locations MW-6 and MW-7 (16 mg/kg). Concentrations at all other locations ranged between 11-15 mg/kg.
Arsenic	Detectable concentrations were noted at all sample locations, ranging between 3-4 mg/kg and having a mean of 3.5. The highest concentration of 4 mg/kg was noted at surface and depth at MW-4 (upgradient) and MW-6 (downgradient).
Mercury	Detectable concentration of 0.06 mg/kg was noted in one surface sample collected at MW-4 located upgradient of the landfill. All other reported concentrations were less than the method detection limit (0.05 mg/kg)
PCBs	All reported concentrations were less than the method detection limit (0.01 mg/kg).
TPH	All reported concentrations were less than the method detection limit (10 mg/kg).

6.9 GROUNDWATER SAMPLE ANALYTICAL DATA

The groundwater chemical analysis results and evaluation of analytical data for the 2011 Tier II Disposal Facility samples are presented in Table XIX. As noted above, MW-4 (upgradient location), MW-5 and MW-6 (downgradient locations) were dry at the time of monitoring and consequently no groundwater samples were collected at these locations. Certificates of analysis and groundwater samples collected as part of the QA/QC program are presented in Appendix C.

Table XIX: Groundwater Chemical Analysis Results – Tier II Disposal Facility

Sample Name	Location	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [ug/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [ug/L]	PCBs [mg/L]	TPH [mg/L]
C311-7W	MW-7	0.054	0.17	0.018	0.29	0.029	2.3 (1)	0.29	0.021	0.044 (1)	<0.000050	<2

(1):Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

S/P/CD/9229/CAM-1/2011/T/Analysis.xls

6.10 THERMISTOR ANNUAL MAINTENANCE REPORTS

The thermistor annual maintenance reports VT-5 to VT-8 are presented in this section.

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-14**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**	Thermistor Location		**Tier II Disposal Facility**			
Thermistor Number:	**VT-5**	Inclination		**Vertical**			
Install Date:	**08/26/2007**	First Date Event		**05-08-2008**	Last Date Event		**2010-08-16**
Coordinates and Elevation	N	**9610,4**	E	**10348,5**		Elev	**43,7**
Length of Cable (m)	**9,5**	Cable Lead Above Ground (m)	**3,20**	Nodal Points			**13**
Datalogger Serial #	**02020218**			Cable Serial Number			

Thermistor Inspection

	Good	Needs Maintenance
Casing	**Yes**	**No**
Cover	**Yes**	**No**
Data Logger	**Yes**	**No**
Cable	**Yes**	**No**
Beads	**Yes**	**No**
Battery Installation Date	**08/19/2010**	
Battery Levels	Main **11,34**	Aux **13,02**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	10,911	8,2095	9	21,41	5,0757
2	11,117	7,8507	10	22,40	-5,9193
3	12,195	5,9675	11	23,35	-6,7403
4	13,936	3,2918	12	24,13	-7,3292
5	16,118	0,4390	13	24,63	-7,8821
6	17,432	-1,1055			
7	18,941	-2,7053			
8	20,15	-3,9572			

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-14**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**		Thermistor Location		**Tier II Disposal Facility**		
Thermistor Number:	**VT-6**		Inclination		**Vertical**		
Install Date:	**08/26/2007**		First Date Event		**05-08-2008**	Last Date Event	**2010-08-16**
Coordinates and Elevation		N	**7615,4**	E	**10315,6**	Elev	**44**
Length of Cable (m)	**9,3**		Cable Lead Above Ground (m)	**3,20**	Nodal Points		**13**
Datalogger Serial #	**02020219**				Cable Serial Number		

Thermistor Inspection

	Good	Needs Maintenance	
Casing	**Yes**	**No**	
Cover	**Yes**	**No**	
Data Logger	**No**	**Yes**	Batteries should be replaced in 2012.
Cable	**Yes**	**No**	
Beads	**Yes**	**No**	
Battery Installation Date	**08/18/2008**		
Battery Levels	Main -	Aux -	

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	10,872		9	21,20	
2	10,867		10	22,34	
3	11,648		11	23,27	
4	13,124		12	24,16	
5	15,572		13	24,82	
6	17,343				
7	18,752				
8	20,11				

Observations and Proposed Maintenance

Unable to communicate with datalogger.Battery levels too low. Batteries inside datalogger installed in June 05'

Recommend battery replacement during next inspection period (2012).

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-14**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**		Thermistor Location		**Tier II Disposal Facility**		
Thermistor Number:	**VT-5**		Inclination		**Vertical**		
Install Date:	**08/26/2007**		First Date Event		**05-08-2008**	Last Date Event	**2010-08-16**
Coordinates and Elevation		N	**9610,4**	E	**10348,5**	Elev	**43,7**
Length of Cable (m)	**9,5**		Cable Lead Above Ground (m)	**3,20**	Nodal Points		**13**
Datalogger Serial #	**02020218**				Cable Serial Number		

Thermistor Inspection

	Good	Needs Maintenance
Casing	**Yes**	**No**
Cover	**Yes**	**No**
Data Logger	**Yes**	**No**
Cable	**Yes**	**No**
Beads	**Yes**	**No**
Battery Installation Date	**08/19/2010**	
Battery Levels	Main **11,34**	Aux **13,02**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	10,911	8,2095	9	21,41	5,0757
2	11,117	7,8507	10	22,40	-5,9193
3	12,195	5,9675	11	23,35	-6,7403
4	13,936	3,2918	12	24,13	-7,3292
5	16,118	0,4390	13	24,63	-7,8821
6	17,432	-1,1055			
7	18,941	-2,7053			
8	20,15	-3,9572			

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-14**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**		Thermistor Location		**Tier II Disposal Facility**		
Thermistor Number:	**VT-8**		Inclination		**Vertical**		
Install Date:	**08/26/2007**		First Date Event		**05-08-2008**	Last Date Event	**2010-08-16**
Coordinates and Elevation		N	**9583,7**	E	**10307,5**	Elev	**43,3**
Length of Cable (m)	**10,3**		Cable Lead Above Ground (m)	**3,30**	Nodal Points		**15**
Datalogger Serial #	**02120062**				Cable Serial Number		

Thermistor Inspection

	Good	Needs Maintenance
Casing	**Yes**	**No**
Cover	**Yes**	**No**
Data Logger	**Yes**	**No**
Cable	**Yes**	**No**
Beads	**Yes**	**No**
Battery Installation Date	**08/19/2010**	
Battery Levels	Main **11,34**	Aux **12,53**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	10,965	8,1241	9	20,77	-4,5291
2	10,799	8,3300	10	21,89	-5,5271
3	11,738	6,7643	11	22,83	-6,3082
4	13,379	4,1285	12	23,47	-6,9807
5	15,507	1,1706	13	24,36	-7,5470
6	17,08	-0,6898	14	24,92	-7,9627
7	18,382	-2,1265	15	25,56	-8,3981
8	19,695	-3,4544			

Observations and Proposed Maintenance

6.11 MONITORING WELL SAMPLING/INSPECTION LOGS

The monitoring well sampling and inspection logs for MW-4 to MW-7 are presented in this section.

2011 Monitoring Well Sampling Log (MW-4)

Site name:	CAM-3
Date of sampling event:	15-Aug-11
Names of samplers:	Andrew Passalis
Monitoring well ID:	MW-4
Facility:	Tier II Disposal Facility

Known Data

Depth of installation* (m):	3,48
Length of screened section (m):	2,00
Depth to top of screen* (m):	0,48

Measured Data

Condition of well:	Good	Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape	Depth to water surface (m):	- (dry)
Well height above ground (m):	0,56	Depth to bottom (m):	2,26
Diameter of well (m):	0,04	Free product thickness (mm):	-

Calculations		Notes	
Depth of water (m):	-	Evidence of sludge:	no
Well volume of water (L):	-	Evidence of freezing/siltation:	no
Static water level* (m):	-		
Length of screen collecting water (m):	-		

Development/Purging Information

Equipment: n/a

Date & Time	Volume Removed (L)	Temperature (°C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
-	-	-	-	-	-	-

Water Sampling		Soil Sampling	
Date & Time Collected:	`-	Date and Time Collected:	15-Aug-11
Sample Number - Water:		Sample Number - Soil:	C311-4WA
			C311-4WB
Sample Containers:		Sample Containers:	3x125mL glass
			3x125mL glass
Procedure/Equipment:		Procedure/Equipment:	Steel & Plastic Trowels
Water Description:		Soil Description:	Light brown sand,
			with gravel and cobbles
			dry
Sampling Equipment Decontamination (Y/N):	n/a	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

2011 Monitoring Well Sampling Log (MW-5)

Site name:	CAM-3				
Date of sampling event:	15-Aug-11				
Names of samplers:	Andrew Passalis				
Monitoring well ID:	MW-5				
Facility:	Tier II Soil Disposal Facility				
Known Data					
Depth of installation* (m):	3,40				
Length of screened section (m):	2,00				
Depth to top of screen* (m):	0,40				
Measured Data					
Condition of well:	Well heaved, casing cover pushed up			Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape			Depth to water surface (m):	- (dry)
Well height above ground (m):	0,69			Depth to bottom (m):	1,75
Diameter of well (m):	0,04			Free product thickness (mm):	-
Calculations			**Notes**		
Depth of water (m):	-			Evidence of sludge:	no
Well volume of water (L):	-			Evidence of freezing/siltation:	no
Static water level* (m):	-				
Length of screen collecting water (m):	-				
Development/Purging Information					
Equipment:	Dedicated waterra tubing and foot valve				

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
-	-	-	-	-	-	-

Water Sampling		**Soil Sampling**	
Date & Time Collected:	-	Date and Time Collected:	15-Aug-11
Sample Number - Water:		Sample Number - Soil:	C311-5WA + Inter QA
			C311-BD2 (5WA)
			C311-5WB
Sample Containers:		Sample Containers:	8x125mL glass
			3x125mL glass
			3x125mL glass
Procedure/Equipment:		Procedure/Equipment:	Steel & Plastic Trowels
Water Description:		Soil Description:	Light brown silt, trace
			fine sand, trace org.
			damp
Sampling Equipment Decontamination (Y/N):	n/a	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

2011 Monitoring Well Sampling Log (MW-6)

Site name:	CAM-3				
Date of sampling event:	15-Aug-11				
Names of samplers:	Andrew Passalis				
Monitoring well ID:	MW-6				
Facility:	Tier II Soil Disposal Facility				
Known Data					
Depth of installation* (m):	4,00				
Length of screened section (m):	2,00				
Depth to top of screen* (m):	0,51				
Measured Data					
Condition of well:	Bentonite heave at base, casing loose			Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape			Depth to water surface (m):	- (dry)
Well height above ground (m):	0,59			Depth to bottom (m):	1,31
Diameter of well (m):	0,04			Free product thickness (mm):	-
Calculations			**Notes**		
Depth of water (m):	-			Evidence of sludge:	no
Well volume of water (L):	-			Evidence of freezing/siltation:	no
Static water level* (m):	-				
Length of screen collecting water (m):	-				
Development/Purging Information					
Equipment:	n/a				

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
-	-	-	-	-	-	-

Water Sampling		**Soil Sampling**	
Date & Time Collected:	-	Date and Time Collected:	15-Aug-11
Sample Number - Water:		Sample Number - Soil:	C311-6WA
			C311-6WB
Sample Containers:		Sample Containers:	3x125mL glass
			3x125mL glass
Procedure/Equipment:		Procedure/Equipment:	Steel & Plastic Trowels
Water Description:		Soil Description:	0-5 black org with silt
			5- Brown/grey silt
			with fine sand, damp
Sampling Equipment Decontamination (Y/N):	n/a	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

2011 Monitoring Well Sampling Log (MW-7)

Site name:	CAM-3
Date of sampling event:	15-Aug-11
Names of samplers:	Andrew Passalis
Monitoring well ID:	MW-7
Facility:	Tier II Soil Disposal Facility

Known Data

Depth of installation* (m):	3,42
Length of screened section (m):	2,00
Depth to top of screen* (m):	0,42

Measured Data

Condition of well:	Good	Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape	Depth to water surface (m):	1,45
Well height above ground (m):	0,50	Depth to bottom (m):	2,05
Diameter of well (m):	0,04	Free product thickness (mm):	-

Calculations		Notes	
Depth of water (m):	0,61	Evidence of sludge:	no
Well volume of water (L):	0,65	Evidence of freezing/siltation:	no
Static water level* (m):	0,95		
Length of screen collecting water (m):	0,61		

Development/Purging Information

Equipment: Dedicated waterra tubing and foot valve

Date & Time	Volume Removed (L)	Temperature (°C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
15-Aug-11	0,9	2,1	7,4	3833	>1000	sl.brown, N/O

Water Sampling		Soil Sampling	
Date & Time Collected:	15-Aug-11	Date and Time Collected:	15-Aug-11
Sample Number - Water:	C311-7W	Sample Number - Soil:	C311-7WA
			C311-7WB
Sample Containers:	3x500mL, 1x250 mL plastic	Sample Containers:	3x125mL glass
			3x125mL glass
Procedure/Equipment:	Waterra tubing & foot valve Hanna HI9828 Mulitmeter, Hach 2100P Turbidimeter	Procedure/Equipment:	Steel & Plastic Trowels
Water Description:	sl.brown, N/O	Soil Description:	Brown sand, trace silt,
			with gravel, damp
			40- some silt
Sampling Equipment Decontamination (Y/N):	N, dedicated	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

7 NORTHEAST LANDFILL

7.1 BACKGROUND AND MONITORING PROGRAM

The Northeast Landfill (NELF) area is located approximately 1 km north of the module train and 650 m southwest of the water lake. The NELF is situated along the crest of a former beach ridge that slopes gently to a low lying area that borders the west side of the landfill. The landfill has eight separate regrade areas (labelled as Lobes A through H for reference), and including engineered cover, encompasses a footprint of approximately 45,000 m^2 with the final cover extending approximately 0.75 m to 1.0 m above the surrounding grade. Based on existing information regarding this landfill as a source of contamination, its potential migration pathways and receptors, the Northeast Landfill was classified as low potential environmental risk. The remediation consisted in removing the surface debris and localized contaminated areas, and regrading with the placement of additional granular fill.

The long-term monitoring plan consists in visual monitoring and periodic collection of soil samples. The 2011 monitoring of this landfill includes a visual inspection and soil sample collection to assess landfill performance. No instrumentation is installed at this landfill.

7.2 VISUAL INSPECTION REPORT

The visual inspection of the Northeast Landfill was conducted on August 16, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table XX of this report.

Settlement

Indications of minor localized settlement were noted on the surface of the lobes, including: four small to moderate sized depressions on the north and east side slopes of Lobe A (Feature A); one moderate sized depresson on the southwest cover area of Lobe B (Feature B); three small round depressions on the west and southwest sides of Lobe C (Feature C); two linear depressions on the southeast corner of Lobe C (Feature D); four small round and linear depressions on the northwest and northeast sides of Lobe D (Feature E); several small round and linear depressions on the west, southwest and central areas of Lobe E (Feature F), one large bowl-shaped depression and one small linear depression on the south side of Lobe E (Feature G); one small round depression on the southwest corner of Lobe G (Feature H); two linear depressions on the northeast corner of Lobe G (Feature I); and four small pot-hole type depressions on the northeast corner of Lobe H (Feature J).

Most features consisted of relatively small subtle depressions located along the margins (crest and side slopes) of the regrade areas. The most noteable areas consisted of an existing medium sized depression along the southeast margin of Lobe A (Feature A) and a large depression on the south side of Lobe E (Feature G) adjacent to a formerly ponded area that bordered the south side of the lobe. Most features appear consistent with the 2010 inspection, with the addition of minor settlement features on the north cover of Lobes E and G. All settlement features have an acceptable severity rating.

Erosion

Seven general areas of erosion (Features K through Q) were noted on the surface or sides of the Northeast Landfill, including: several small features along the west side of Lobe A (Feature K); six locations on the west and northwest sides of Lobe B (Feature L); along the north toe of Lobe B (Feature M); one location on the south side of Lobe C (Feature N); two locations on the east side of Lobe E (Feature O); one location on the southeast cover of Lobe G (Feature P); and one location on the north side of Lobe G (Feature Q). In all cases, surface runoff has resulted in the washing of fines from the more resistant sand and gravel cover material in each area. Most features appear consistent with the 2010

inspection, with the exception of additional erosion on the north side of Lobe A, the southeast cover of Lobe G, and the addition of minor erosion on the north toe of Lobe B. All features appear to be self-armouring and have an acceptable severity rating.

Frost Action
No indications of frost action were noted. Please see Other Features of Note below.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
No indications of vegetation were noted on the landfill.

Staining
Five areas with localized staining were noted during the 2011 inspection, including: one small stained area located in Lobe A (Feature AA), two relatively small areas of rust-coloured staining along the northwest toe of Lobe C (Feature R) and the southwest toe of Lobe G (Feature U), both associated with localized water ponding along the downgradient sides of the lobe; and three small areas of dark staining on the surface of Lobe D (Feature S) and Lobe G (Feature T). The dark stained areas exhibited an “oily” odour and appeared isolated to the surface cover materials.
The staining appears consistent with findings from the 2010 inspection. There was no sheen associated with the staining at the time of the inspection.

Seepage Points
No evidence of specific seepage points was noted.

Debris
No evidence of debris was noted at the landfill.

Presence/Condition of Monitoring Instruments
No monitoring instruments are installed at this landfill.

Other Features of Note
Several areas with tension cracks were observed on the surface and/or side slopes of the landfill, including: single and parallel cracks up to 30 mm in width extending across the southwest cover and side slope of Lobes B (Feature V); semi-continuous single and parallel cracks up to 10 mm in width extending along the west and northwest crest and north side slope of Lobe C (Feature X); small and medium sized cracks up to 10 cm in width extending across the north, south and west side slopes on the south end of Lobe G (Feature Y); and two continuous cracks up to 20 mm in width extending across the northeast corner and side slope of Lobe G (Feature Z). Overall, the frequency and magnitude of cracks appears to have increased, with the appearance of new cracks on the north side of Lobe C and west and south sides of Lobe G, most of which are located in close proximity to ponded water or drainage features at the regrade margins.

Three isolated areas of disturbed cover material (Feature W) were noted on the northeast side slope of Lobe B (1) and west side slope of Lobe F (2). Each rectangular shaped area has either had a small amount of granular material removed or disturbed by heavy equipment (loader) activity. The disturbances ranged up to 6 m long, 5 m wide and 25 cm in depth, with no exposed debris noted at the time of the inspection. This Feature was not noted during the previous 2010 inspection.

Discussion
The Northeast Landill performance with respect to containment of the debris within the various regrades at the Northeast Landfill is rated as acceptable. A visual inspection report, including supporting photos and a drawing, is presented in the following pages.

Minor settlement features were noted on the surface and/or side slopes of most Lobes. Localized runoff has also resulted in minor erosional features on the surface and along the margins of numerous regrade areas. These features appear to be relatively consistent with findings from the 2010 inspection with no significant increase in the magnitude of erosion noted. Two isolated areas of rust-coloured staining were noted on the northwest side of Lobe C and southwest side of Lobe G, both consistent with previous observations. Minimal ponding was observed around the downgradient margins of Lobe G, consistent with the previous 2010 inspection period.

Table XX: Visual Inspection Checklist / Report – Northeast Landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: CAM-3 Shepherd Bay
LANDFILL DESIGNATION: Northeast Landfill (Regrade Landfill)
DATE OF INSPECTION: August 16, 2011
DATE OF PREVIOUS INSPECTION: August 16-17, 2010
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: CAM-3 Shepherd Bay
Landfill: Northeast Landfill
Designation: Regrade Landfill
Date Inspected: August 16, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature:

CAM-3 NORTHEAST LANDFILL

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure CAM-3.6 (Lobe A) 2 New Obs.	0.7 - 5 m	0.1 - 1.5 m	5 - 20 cm	Occasional	Moderate and minor surface depressions	NELF-2, 4, 5, 9, 10, 12	Acceptable	Moderate depression on southeast side slope and minor depressions on northwest corner (new obs.), east crest (new obs.) and north crest of lobe.
		FEATURE B See Figure CAM-3.6 (Lobe B)	4 m	0.4 m	5 cm	Isolated	Subtle surface depression	NELF-17		Minor linear depression on west cover of lobe.
		FEATURE C See Figure CAM-3.6 (Lobe C - W Side)	0.4 m	0.3 m	10 cm	Occasional	Minor surface depressions	NELF-39		Several small potholes on west side and southeast corner of lobe.
		FEATURE D See Figure CAM-3.6 (Lobe C - E Side)	0.3 m	0.2 m	10 cm	Isolated	Minor surface depression	NELF-43		Minor depression onsoutheast side slope of lobe.
		FEATURE E See Figure CAM-3.6 (Lobe D)	0.3 - 3 m	0.3 - 0.5 m	5 - 10 cm	Occasional	Minor surface depressions	NELF-44, 45, 51		Minor depressions on northwest and northeast corners of lobe.
		FEATURE F See Figure CAM-3.6 (Lobe E - W and N Sides) 3 New Obs.	0.7 - 3.5 m	0.15 - 0.5 m	5 - 10 cm	Occasional	Minor surface depressions	NELF-55-58, 73, 74		Minor linear and pothole-type depressions on southwest and west sides and north central area (new obs.) of lobe.
		FEATURE G See Figure CAM-3.6 (Lobe E - E Side)	30 m 2 m	20 m 0.3 m	30 - 80 cm 2 - 3 cm	Occasional (3%)	Large bowl shaped depression and small linear depression on south end of lobe	NELF-69, 64		Large bowl shaped depression adjacent to former ponded area on south side of lobe.
		FEATURE H See Figure CAM-3.6 (Lobe G - SE Corner)	0.5 m	0.3 m	5 cm	Isolated	Minor surface depression	NELF-89		Single depression on southeast corner of lobe.
		FEATURE I See Figure CAM-3.6 (Lobe G - NE Corner) New Obs.	3 - 5 m	0.6 m	5 - 7 cm	Isolated	Linear surface depression (ruts)	NELF-99		Parallel linear depressions (vehicle ruts) on northeast area of lobe.
		FEATURE J See Figure CAM-3.6 (Lobe H)	1 - 2 m	0.2 - 1 m	5 - 10 cm	Isolated	Minor surface depressions	NELF-123, 124		Minor depression on north and northeast cover of lobe.
Erosion	Yes	FEATURE K See Figure CAM-3.6 (Lobe A)	1 - 3 m	0.1 - 0.6 m	5 - 10 cm	Occassional (5%)	Minor surface erosion on north and west side slopes	NELF-10, 11, 13	Acceptable	Numerous locations extending along west and northwest sides of Lobes A and B. The erosion is the result of fines washing from the erosion resistant cover material.
		FEATURE L See Figure CAM-3.6 (Lobe B)	5 - 6 m	0.3 - 0.7 m	2 - 10 cm	Occassional (1%)	Minor surface erosion on north and northwest side slopes	NELF-18, 2, 232, 26		
		FEATURE M See Figure CAM-3.6 (Lobe B)	35 m	1 m	5 cm	N/A	Minor eroson adjacent to toe on north side of lobe.	NELF-25, 27		Minor erosion along toe. Not in contact with landfill.
		FEATURE N See Figure CAM-3.6 (Lobe C)	5 - 10 m	0.1 - 0.5 m	1 - 5 cm	Isolated	Minor surface erosion	NELF-42		Minor erosion on northwest and southwest side slopes of lobe.
		FEATURE O See Figure CAM-3.6 (Lobe E)	3.5 m	0.3 - 0.5 m	2 - 3 cm	Isolated	Minor surface erosion on south side of lobe	NELF-67, 68		Minor erosion, washing of fines.
		FEATURE P See Figure CAM-3.6 (Lobe G)	20 m	0.2 - 1 m	2 - 3 cm	Isolated	Minor surface erosion on southeast side of lobe	NELF-90, 91		Minor erosion, washing of fines.
		FEATURE Q See Figure CAM-3.6 (Lobe G)	4 m	0.2 - 0.3 m	2 - 3 cm	Isolated	Minor surface erosion on north side of lobe	NELF-102		Minor erosion, washing of fines.
Frost Action	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Vegetation	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A

Staining	Yes	FEATURE AA See Figure CAM-3.6 (Lobe A)	1.0 m	0.7 m	Unknown	Isolated	Isolated Stain	NELF-6	Acceptable	Small stain on soil cover area.
		FEATURE R See Figure CAM-3.6 (Lobe C)	3 m	0.5 m	Unknown	Isolated	Localized rust coloured staining on northwest toe	NELF-38	Acceptable	Small area of rust coloured staining associated with formerwater ponded area along northwest toe.
		FEATURE S See Figure CAM-3.6 (Lobe D)	0.3 m	0.2 - 0.3 m	Unknown	Isolated	Two isolated areas of dark staining	NELF-52, 53	Acceptable	Two small areas of dark staining on north end of lobe.
		FEATURE T See Figure CAM-3.6 (Lobe G - SE cover)	0.2 m	0.25 m	Unknown	Isolated	Isolated area of dark staining	NELF-92	Acceptable	Area of dark staining on southeast area of lobe.
		FEATURE U See Figure CAM-3.6 (Lobe G - W side)	3 m	0.5 m	Unknown	Isolated	Localized rust coloured staining adjacent to toe	NELF-92	Acceptable	Area of rust coloured staining in former ponded area.
Vegetation Stress	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	None	N/A	N/A	Not Observable	N/A
Other Features of Note:	Yes	FEATURE V See Figure CAM-3.6 (Lobe B)	3 - 10 m	2 - 30 mm	Unknown	Isolated	Single and parallel tension cracks	NELF-19-21	Acceptable	Crack extends across southwest cover of lobe.
		FEATURE W See Figure CAM-3.6 (Lobes B & F) New Obs.	3 - 6 m	4 - 5 m	5 - 25 cm	Isolated	Diturbed areas on side slopes	NELF-28, 29, 77-80	Acceptable	Three disturbed areas on side slopes resulting from on-site NWS activity.
		FEATURE X See Figure CAM-3.6 (Lobe C) Some New Obs.	1 - 15 m	2 -10 mm	Unknown	Isolated	Single and parallel tension cracks	NELF-33, 34, 36, 37, 39-41	Acceptable	Multiple single and parallel cracks extending along west and north crests of lobe. Some new and partially infilled cracks.
		FEATURE Y See Figure CAM-3.6 (Lobe G - S and W sides) Some New Obs.	3 - 25 m	0.2 - 10 cm	Unknown	Isolated	Tension cracks extending across south and west side slopes	NELF-107-112, 114, 115, 117, 118, 120	Acceptable	Single and parallel cracks extending across south and west side slopes on south end of lobe. Increase in size and frequency noted.
		FEATURE Z See Figure CAM-3.6 (Lobe G - N corner)	13 - 20 m	2 - 20 mm	Unknown	Isolated	Tension cracks extending across northeast corner and side slope of lobe	NELF-95-98, 100, 101	Acceptable	Two cracks exting along northeast side slope and cover areas.
Additional Photos	Yes	See Figure CAM-3.6 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

7.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the Northeast Landfill has been completed as per the ToR and is included as Table XXI hereafter.

Table XXI: Preliminary Stability Assessment – Northeast Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occassional
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

7.4 LOCATION PLAN

The Location Plan for the Northeast Landfill has been completed as per the ToR and is presented in Figure CAM-3.6.

10 300 E

10 400 E

10 500 E

FEATURE V
TENSION CRACKS
3-10m L, 2-30mm W

FEATURE L
MINOR EROSION
5-6m L, 0.3-0.7m W, 0.02-0.1m D

FEATURE K
MINOR EROSION
1-3m L, 0.1-0.6m W, 0.05-0.1m D

FEATURE B
MINOR SETTLEMENT
4m L, 0.4m W, 0.1m D

FEATURE M
MINOR EROSION
35m L, 1m W, 0.05m D

TBM208

FEATURE N
MINOR EROSION
5-10m L, 0.1-0.5m W, 0.01-0.05m D

FEATURE C
MINOR SETTLEMENT
0.4m L, 0.3m W, 0.1m D

FEATURE R
STAINING
3m L, 0.5m W

FEATURE X
TENSION CRACKS
1-15m L, 2-10mm W

FEATURE D
MINOR SETTLEMENT
0.3m L, 0.2m W, 0.1m D

FEATURE AA
MINOR STAINING
1.0m L, 0.7m W

FEATURE W
DISTURBED AREA
4m L, 4m W, 25cm D

FEATURE A
MINOR SETTLEMENT
0.7-5.0m L, 0.1-1.5m W, 0.05-0.2m D

FEATURE E
MINOR SETTLEMENT
0.3-3.0m L, 0.3-0.5m W, 0.05-0.1m D

FEATURE S
STAINING
0.3m L, 0.2-0.3m W

FEATURE F
MINOR SETTLEMENT
0.7-3.5m L, 0.15-0.5m W, 0.05-0.1m D

FEATURE G
MINOR SETTLEMENT
0.2-30m L, 0.3-20m W, 0.02-0.8m D

FEATURE O
MINOR EROSION
3.5m L, 0.3-0.5m W, 0.02-0.03m D

TO STATION AREA

ACCESS ROAD

LEGEND

- TBM208 — TEMPORARY BENCHMARK
- 117 — PICTURE NUMBER VIEWPOINT
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (NTS)
- STAINING
- PONDING

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
A	FINAL	12-01-26	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

NORTHEAST LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 1,000	JANUARY 2012
DRAWN BY:	VERIFIED BY:	APPROVED BY:
P. LÉGARÉ	A. PASSALIS	P. GÉLINAS
PROJECT NO:	DRAWING NO:	PAGE
CD9229_002_160	CD9229_002_160-CAM-3_6	PL1

FIGURE CAM-3.6a

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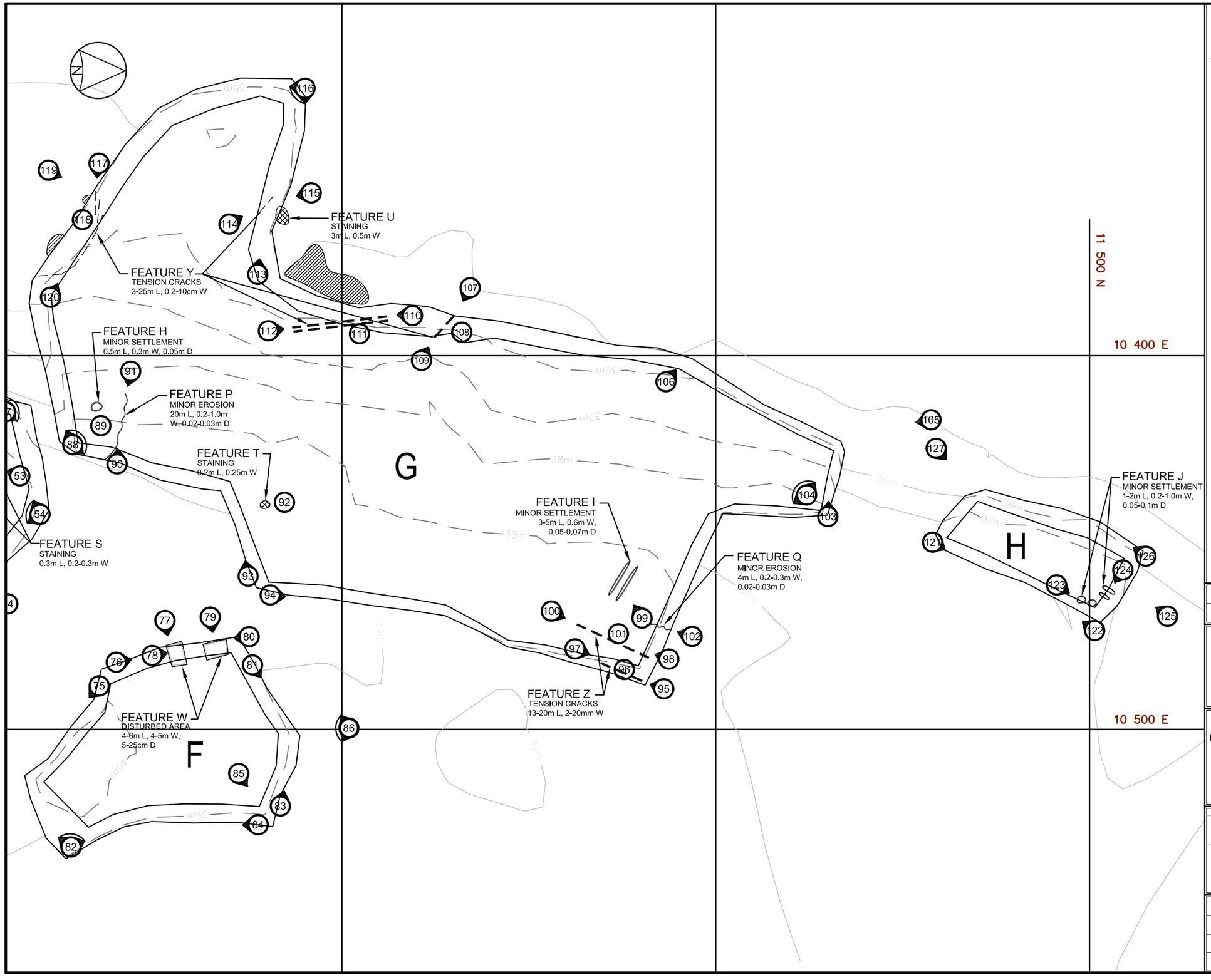

LEGEND

- TBM208 — TEMPORARY BENCHMARK
- 107 — PICTURE NUMBER VIEWPOINT
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (NTS)
- STAINING
- PONDING

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	P.L. PAR	A.P. VERIF.	P.G. APPR.
A	FINAL	12-01-26			

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MEASUREMENT UNIT	SCALE:	DATE (month-year):
Meter	1 : 1,000	JANUARY 2012
DRAWN BY: P. LÉGARÉ	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GÉLINAS
PROJECT NO: CD9229_002_160	DRAWING NO: CD9229_002_160-CAM-3_6	PAGE PL2

FIGURE CAM-3.6b

7.5 PHOTOGRAPHIC RECORDS

The Photographic Record for the Northeast Landfill has been completed as per the ToR and is included as Table XXII hereafter. The Photographic Record contains only an index and “thumbnail” photographs. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XXII: Landfill Visual Inspection Photo Log – Northeast Landfill

LANDFILL VISUAL INSPECTION PHOTO LOG
Site Name: CAM-3, Shepherd Bay
Landfill: Northeast Landfill
Date Inspected: August 16, 2011
Inspected by: Andrew Passalis, P.Eng.
EGE Engineering Ltd.

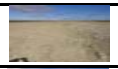
Photo (NELF-)	Thumbnails	Filename	Date	Vantage Point		Caption
				Easting	Northing	
Lobe A						
1		C311_4612	2011-09-28	10749	11913	Panoramic view looking NW to E from south of Lobe A
2		C311_4613	2011-08-16	10760	11872	View looking NNE along east toe of Lobe A. Note large depression on side slope. - FEATURE A
3		C311_4614	2011-08-16	10759	11874	View looking SW along south toe of Lobe A
4		C311_4615	2011-08-16	10778	11868	View looking SSW at large depression on south side slope of Lobe A (5m L, 1.5m W, 20cm D) - FEATURE A
5		C311_4616	2011-08-16	10791	11866	View looking SSW at depression adjacent on south crest of Lobe A (2m L, 1m W, 5cm D) - FEATURE A
6		C311_4617	2011-08-16	10793	11875	View of small stain noted on south cover area of Lobe A (1m L, 0.7m W) - FEATURE AA
7		C311_4618	2011-08-16	10809	11862	View looking NW along northeast toe of Lobe A
8		C311_4619	2011-08-16	10807	11862	View looking SSW along east toe of Lobe A
9		C311_4620	2011-08-16	10822	11884	View looking SE at minor depression on north side of Lobe A (0.7 L, 0.6m W, 10cm D) - FEATURE A
10		C311_4621	2011-08-16	10825	11871	View looking SSW at minor erosion on north side slope (1m L, 0.1m W, 5cm D) - FEATURE K
11		C311_4622	2011-08-16	10824	11887	View looking SW at minor erosion along west slope of Lobe A - FEATURE K
12		C311_4623	2011-08-16	10819	11896	View looking NE at settlement on northwest corner of Lobe A (2m L, 1m E, 15cm D) - FEATURE A
13		C311_4624	2011-08-16	10808	11900	View looking ESE at minor erosion on west slope of Lobe A (1-3m L,0.1-0.6m W, 3-10cm D) - FEATURE K
Lobe B						
14		C311_4626	2011-09-28	10829	11896	Panoramic view looking W to N across surface from southeast corner of Lobe B
15		C311_4627	2011-09-28	10831	11921	Panoramic view looking NW to NE across surface from mid-south side of Lobe B

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

16		C311_4628	2011-09-28	10843	11963	Panoramic view looking NE to SE from southwest of Lobe B
17		C311_4629	2011-08-16	10861	11935	View looking S at subtle depression on surface of Lobe B (4m L 0.4m W, 5cm D) - FEATURE B
18		C311_4630	2011-08-16	10858	11953	View looking ESE at three points of erosion on west side slope of Lobe B (5m L, 0.1-0.7m W, 3-10cm D) - FEATURE L
19		C311_4632	2011-08-16	10850	11948	View looking E at start of small crack on southwest side slope of Lobe B (3m L, 2-3mm W) - FEATURE V
20		C311_4633	2011-08-16	10854	11939	View looking SW at tension cracks extending towards southwest corner of Lobe B (10m L, 2-3mm W) - FEATURE V
21		C311_4634	2011-08-16	10844	11942	View of second partially infilled crack extending on southwest corner of Lobe B (10m L, 30mm W) - FEATURE V
22		C311_4635	2011-08-16	10888	11945	View looking SE at minor erosion on north side of Lobe B (6m L, 0.2-0.3m W, 5cm D) - FEATURE L
23		C311_4636	2011-08-16	10876	11937	View looking NW at minor erosion on north side of Lobe B (6m L, 0.2-0.3m W, 5cm D) - FEATURE L
24		C311_4637	2011-09-28	10897	11950	Panoramic view looking E to S from northwest of Lobe B
25		C311_4639	2011-08-16	10890	11933	View looking ESE along north side of Lobe B. Note minor washing of fines along toe. - FEATURE L
26		C311_4640	2011-08-16	10893	11927	View looking S at minor erosion on north side of Lobe B (6m L, 0.2m W, 2-3cm D) - FEATURE L
27		C311_4641	2011-08-16	10873	11890	View looking NW along north toe of Lobe B - FEATURE M
28		C311_4642	2011-08-16	10859	11882	View looking W at recent disturbed area on northeast side slope of Lobe B (4m L, 4m W) - FEATURE W
29		C311_4643	2011-08-16	10850	11889	View looking N at recent disturbed area on northeast side slope of Lobe B (4m L, 4m W) - FEATURE W
Lobe C						
30		C311_4638	2011-08-16	10907	11949	Panoramic view looking N to E from southwest of Lobe C
31		C311_4737	2011-08-16	10992	11904	View looking NW along north toe of Lobe C

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

31		C311_4737	2011-08-16	10992	11904	View looking NW along north toe of Lobe C
32		C311_4738	2011-08-16	10985	11901	View looking SE along east toe of Lobe C
33		C311_4739	2011-08-16	10981	11910	View looking N at crack on north side slope of Lobe C (5m L, 2-3mm W) - FEATURE X
34		C311_4740	2011-08-16	10997	11909	View looking S at crack on north side slope of Lobe C (5m L, 2-3mm W) - FEATURE X
35		C311_4742	2011-09-28	10993	11927	Panoramic view looking E to S from northwest corner of Lobe C
36		C311_4743	2011-08-16	10987	11915	View looking W at along top of slope at northwest corner of Lobe C (8m L, 4-8mm W) - FEATURE X
37		C311_4744	2011-08-16	11002	11921	View looking S at crack (15m L, 2-10mm W)on northwest side of Lobe C - FEATURE X
38		C311_4745	2011-08-16	11002	11929	View looking S at rust coloured staining at former ponded area on northwest toe of Lobe C (3m L, 0.5m W) - FEATURE R
39		C311_4746	2011-08-16	10969	11931	View looking S at minor depressions (0.4m L, 0.2m W, 10cm D) - FEATURE C and parallel cracks (2-5mm W) along west surface of Lobe C - FEATURE X
40		C311_4747	2011-08-16	10957	11927	View of parallel cracks (2-5mm W) along west surface of Lobe C - FEATURE X
41		C311_4751	2011-08-16	10944	11929	View looking SE at partially infilled parallel cracks on the southwest corner of Lobe C (1-2m L, 2-4cm W) - FEATURE X
42		C311_4752	2011-08-16	10920	11927	View looking N at minor eroson on southwest corner of Lobe C (10m L, 0.1m W, 5cm D) - FEATURE N
43		C311_4755	2011-08-16	10931	11899	View looking N at pothole depressions on southeast corner of Lobe C (0.3m L, 0.2m W, 10cm D) - FEATURE D
Lobe D						
44		C311_4667	2011-08-16	11019	11818	View looking SW at minor depression on east slope of Lobe D (0.7m L, 0.4m W, 5cm D) - FEATURE E
45		C311_4668	2011-08-16	11008	11820	View looking W at linear depression on northeast corner of Lobe D (3m L, 0.5m W, 5-7cm D) - FEATURE E

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

32		C311_4738	2011-08-16	10985	11901	View looking SE along east toe of Lobe C
33		C311_4739	2011-08-16	10981	11910	View looking N at crack on north side slope of Lobe C (5m L, 2-3mm W) - FEATURE X
34		C311_4740	2011-08-16	10997	11909	View looking S at crack on north side slope of Lobe C (5m L, 2-3mm W) - FEATURE X
35		C311_4742	2011-09-28	10993	11927	Panoramic view looking E to S from northwest corner of Lobe C
36		C311_4743	2011-08-16	10987	11915	View looking W at along top of slope at northwest corner of Lobe C (8m L, 4-8mm W) - FEATURE X
37		C311_4744	2011-08-16	11002	11921	View looking S at crack (15m L, 2-10mm W)on northwest side of Lobe C - FEATURE X
38		C311_4745	2011-08-16	11002	11929	View looking S at rust coloured staining at former ponded area on northwest toe of Lobe C (3m L, 0.5m W) - FEATURE R
39		C311_4746	2011-08-16	10969	11931	View looking S at minor depressions (0.4m L, 0.2m W, 10cm D) - FEATURE C and parallel cracks (2-5mm W) along west surface of Lobe C - FEATURE X
40		C311_4747	2011-08-16	10957	11927	View of parallel cracks (2-5mm W) along west surface of Lobe C - FEATURE X
41		C311_4751	2011-08-16	10944	11929	View looking SE at partially infilled parallel cracks on the southwest corner of Lobe C (1-2m L, 2-4cm W) - FEATURE X
42		C311_4752	2011-08-16	10920	11927	View looking N at minor eroson on southwest corner of Lobe C (10m L, 0.1m W, 5cm D) - FEATURE N
43		C311_4755	2011-08-16	10931	11899	View looking N at pothole depressions on southeast corner of Lobe C (0.3m L, 0.2m W, 10cm D) - FEATURE D
Lobe D						
44		C311_4667	2011-08-16	11019	11818	View looking SW at minor depression on east slope of Lobe D (0.7m L, 0.4m W, 5cm D) - FEATURE E
45		C311_4668	2011-08-16	11008	11820	View looking W at linear depression on northeast corner of Lobe D (3m L, 0.5m W, 5-7cm D) - FEATURE E

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

61		C311_4651	2011-08-16	10917	11762	View looking N along east toe of Lobe E.
62		C311_4652	2011-09-28	10903	11742	Panoramic view looking W to N from southeast of Lobe E
63		C311_4653	2011-09-28	10919	11769	Panoramic view looking W to N across surface from southeast corner of Lobe E
64		C311_4654	2011-08-16	10937	11770	View looking SW at linear depression on southeast area of Lobe E (2m L, 0.3m W, 10-15cm D) - FEATURE G
65		C311_4655	2011-08-16	10952	11784	View looking N along east toe of Lobe E.
66		C311_4656	2011-08-16	10950	11780	View looking SE along southeast toe of Lobe E.
67		C311_4657	2011-08-16	10962	11788	View looking E at minor eroson on east side of Lobe E (3.5m L, 0.3-0.5m W, 2-3cm D) - FEATURE O
68		C311_4658	2011-08-16	10960	11776	View looking W at minor eroson on east side of Lobe E (3.5m L, 0.3-0.5m W, 2-3cm D) - FEATURE O
69		C311_4661	2011-08-16	10991	11774	View looking S along northeast toe of Lobe E
70		C311_4662	2011-08-16	11004	11781	View looking SE along northeast toe of Lobe E
71		C311_4663	2011-08-16	11005	11784	View looking WSW along north toe of Lobe E
72		C311_4664	2011-09-28	10998	11808	Panoramic view looking E to S across surface from northeast corner of Lobe E.
73		C311_4665	2011-08-16	10980	11799	View looking SE at three areas of localized depressions on north surface of Lobe E (0.5-1m L, 0.3m W, 5-10cm D) - FEATURE F
74		C311_4666	2011-08-16	10981	11815	View looking S at linear depression on west slope (1m L, 0.5m W, 25cm D) - FEATURE F
Lobe F						
75		C311_4680	2011-08-16	11043	11796	View looking SE along south toe of Lobe F
76		C311_4681	2011-08-16	11046	11801	View looking NNW along west side of Lobe F. Note disturbed area along side slope in background.

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

77		C311_4682	2011-08-16	11060	11813	View looking ENE at disturbed area on west side slope of Lobe F (4m L, 3m W, 25cm D) - FEATURE W
78		C311_4683	2011-08-16	11057	11804	View looking NNW at disturbed area on west side slope of Lobe F (4m L, 3m W, 25cm D) - FEATURE W
79		C311_4684	2011-08-16	11073	11814	View looking ENE at disturbed area on west side slope of Lobe F (5m L, 6m W) - FEATURE W
80		C311_4685	2011-08-16	11082	11808	View looking SSE at disturbed area on west side slope of Lobe F (5m L, 6m W) - FEATURE W
81		C311_4686	2011-08-16	11083	11805	View looking NE along north side of Lobe F
82		C311_4688	2011-09-28	11035	11754	Panoramic view looking S to W from southeast corner of Lobe F
83		C311_4689	2011-08-16	11091	11763	View looking NW along north toe of Lobe F
84		C311_4690	2011-08-16	11088	11760	View looking S along east toe from northeast corner of Lobe F
85		C311_4691	2011-08-16	11082	11772	View looking NE at former ponded area on northeast corner of Lobe F
86		C311_4692	2011-09-28	11110	11784	Panoramic view looking SE to SW from north of Lobe F
Lobe G						
87		C311_4676	2011-09-28	11018	11869	Panoramic view looking SW to NE at Lobe G from northwest corner of Lobe D
88		C311_4693	2011-09-28	11036	11859	Panoramic view looking WSW to NE across surface from southeast corner of Lobe G
89		C311_4694	2011-08-16	11044	11868	Minor depression on southeast corner of Lobe G (0.5m L, 0.3m W, 5cm D) - FEATURE H
90		C311_4695	2011-08-16	11047	11854	View looking W at minor erosion extending across southeast surface of Lobe G (20m L, 0.2-1m W, 2-3cm D) - FEATURE P
91		C311_4696	2011-08-16	11052	11879	View looking E at minor erosion extending across southeast surface of Lobe G (20m L, 0.2-1m W, 2-3cm D) - FEATURE P

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

92		C311_4697	2011-08-16	11089	11844	Stained areas on east side of Lobe G (0.2m L, 0.25m W) - FEATURE T
93		C311_4699	2011-08-16	11085	11824	View looking SW along south toe on south side of Lobe G
94		C311_4700	2011-08-16	11088	11821	View looking N along east toe of Lobe G
95		C311_4701	2011-08-16	11193	11796	View looking SW at tension cracks extending across northeast slope of Lobe G (13m L, 5-20mm W) - FEATURE Z
96		C311_4702	2011-08-16	11184	11800	View of tension crack extending across northeast slope of Lobe G (13m L, 5-20mm W) - FEATURE Z
97		C311_4703	2011-08-16	11172	11804	View looking NE at tension cracks extending across northeast slope of Lobe G (13m L, 5-20mm W) - FEATURE Z
98		C311_4704	2011-08-16	11194	11803	View looking SW at single tension crack extending on northeast cover of Lobe G (20m L, 2-8mm W) - FEATURE Z
99		C311_4705	2011-08-16	11188	11814	View looking SW at vehicle ruts on northeast cover of Lobe G (3-5m L, 0.6m W, 5-7cm D) - FEATURE I
100		C311_4706	2011-08-16	11164	11815	View looking NE at single tension crack extending on northeast cover of Lobe G (20m L, 2-8mm W) - FEATURE Z
101		C311_4707	2011-08-16	11182	11809	View of single crack extending on northeast cover of Lobe G (20m L, 2-8mm W) - FEATURE Z
102		C311_4708	2011-08-16	11199	11810	View looking SW at minor erosion on northeast slope of Lobe G (4m L, 0.2-0.3m W, 2-3cm D) - FEATURE Q
103		C311_4709	2011-08-16	11237	11842	View looking W along north toe from northeast corner of Lobe G
104		C311_4710	2011-09-28	11232	11847	Panoramic view looking SE to WNW across surface from northeast corner of Lobe G
105		C311_4719	2011-08-16	11265	11868	View looking S from northwest of Lobe G
106		C311_4720	2011-08-16	11195	11877	View looking NW along dry drainage feature extending from west toe of Lobe G

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

107		C311_4721	2011-08-16	11142	11902	View looking SE at crack extending on west slope of Lobe G (3m L, 5-10mm W) - FEATURE Y
108		C311_4722	2011-08-16	11137	11891	View of crack extending on west slope of Lobe G (3m L, 5-10mm W) - FEATURE Y
109		C311_4723	2011-08-16	11129	11883	View looking NW at crack extending on west slope of Lobe G (3m L, 5-10mm W) - FEATURE Y. Note former drainage feature beyond toe of regrade area.
110		C311_4726	2011-08-16	11128	11896	View looking SSE at partially infilled parallel cracks extending upslope on west side of Lobe G (25m L, 5-30mm W) - FEATURE Y
111		C311_4727	2011-08-16	11113	11893	View of infilled parallel cracks extending upslope on west side of Lobe G (25m L, 5-30mm W) - FEATURE Y
112		C311_4728	2011-08-16	11088	11891	View looking NW at partially infilled parallel cracks extending upslope on west side of Lobe G (25m L, 5-30mm W) - FEATURE Y
113		C311_4729	2011-08-16	11085	11906	View looking WNW at minor ponding along north toe of southwest extension on Lobe G
114		C311_4730	2011-08-16	11082	11919	View looking NW at tension crack on north slope of southwest extension on Lobe G (4m L, 5cm W, 15cm D) - FEATURE Y
115		C311_4731	2011-08-16	11100	11928	View looking SE at tension crack on north slope of southwest extension on Lobe G (4m L, 5cm W, 15cm D) - FEATURE Y. Note staining in former ponded area adjacent to toe (3m L, 0.5m W) - FEATURE U
116		C311_4732	2011-09-28	11097	11956	Panoramic view looking E to S from northwest corner of southwest extension on Lobe G
117		C311_4733	2011-08-16	11043	11936	View looking E at three cracks extending across south side slope of Lobe G (4-6m L, 5-10cm W) - FEATURE Y
118		C311_4734	2011-08-16	11046	11923	View of crack extending across south side slope of Lobe G (4-6m L, 5-10cm W) - FEATURE Y
119		C311_4735	2011-08-16	11030	11933	View looking NNE at three cracks extending across south side slope of Lobe G (4-6m L, 5-10cm W) - FEATURE Y
120		C311_4736	2011-08-16	11030	11901	View looking WNW at tension crack extending across south slope of Lobe G (20m L, 1-4mm W) - FEATURE Y

Table XXII (Continued): Landfill Visual Inspection Photo Log – Northeast Landfill

Lobe H						
121		C311_4711	2011-08-16	11266	11833	View looking NE along along south toe from southeast corner of Lobe H
122		C311_4712	2011-08-16	11309	11811	View looking SW along east toe from northeast corner of Lobe H
123		C311_4714	2011-08-16	11300	11822	View looking NE at minor depressions on northeast corner of Lobe H (1m L, 1m W, 5cm D) - FEATURE J
124		C311_4715	2011-08-16	11318	11827	View looking SE at minor depressions on the north side of Lobe H (1-2mL, 0.2-1m W, 5-10cm D) - FEATURE J
125		C311_4716	2011-08-16	11329	11816	View looking SW from northeast of Lobe H
126		C311_4717	2011-08-16	11323	11830	View looking SW along west toe from northwest corner of Lobe H
127		C311_4718	2011-08-16	11267	11859	View looking NE from southwest of Lobe H

8 USAF LANDFILL

8.1 BACKGROUND AND MONITORING PROGRAM

The USAF Landfill is constructed approximately 2.5 km northeast of the main station area and 1.2 km northeast of the airstrip along the east side of the Winter Water Lake road. The landfill, including engineered cover, encompasses an area of approximately 15,000 m^2 with the final cover extending approximately 4-5 m above existing grade. Based on existing information regarding this landfill as a source of contamination, its potential migration pathways and receptors, the USAF Landfill was classified as moderate potential environmental risk.

The remediation consisted in excavating contaminated soil downgradient of the landfill, and installing a modified leachate containment system that would effectively encapsulate Tier II contaminated soil present on the landfill's surface. The design consisted of a synthetic liner system and the placement of sufficient granular fill at surface to cause aggradation of permafrost through the landfill contents. Four groundwater monitoring wells are installed on the landfill perimeter and four thermistors are installed within the landfill footprint to monitor freeze back conditions.

The long-term monitoring plan consists in visual monitoring, collection of soil and groundwater samples and monitoring of subsurface ground temperatures.

The 2011 monitoring of this landfill includes visual inspection to verify for evidence of settlement or erosion, collection of soil and groundwater samples to monitor for the presence of leachate and retrieval of data from the thermistors. Groundwater monitoring wells, soil sample and thermistor installation locations are identified on Figure CAM-3.7.

Soil and groundwater at all stations and monitoring wells were sampled as specified. Groundwater from each of the monitoring wells was sampled as per the ToR, with the exception of MW-12 which was dry at the time of sampling.

8.2 VISUAL INSPECTION REPORT

The visual inspection of the USAF Landfill was conducted on August 15, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table XXIII of this report.

Settlement

Evidence of minor settlement was noted in two general areas on the landfill surface, including: three small to medium sized depressions on the east and southeast side slopes (Feature A); and two subtle linear and oval-shaped depressions on the west cover area of the landfill (Feature B). Feature A included one newly noted 5 m x 3 m x 15 cm deep depression located around an erosion feature (Feature C) situated on the east side slope of the landfill. Similarly, Feature B depressions were not noted/observed during the previous 2010 inspection. All settlement features have an acceptable severity rating.

Erosion

Three areas of minor erosion were noted on the east and south facing slopes of the landfill (Feature C). All locations consisted of shallow surface erosion that extended perpendicular to the slope from crest to toe. The areas affected appear to be self-armouring and have an acceptable severity rating. The erosion on the east and south slopes is consistent with findings from the previous 2010 inspection.

One newly noted area of minor surface erosion (fines washing) up to 2 cm deep along the northeast side of the landfill (Feature D). The erosion is not in direct contact with the landfill. Overall, the facility cover appears stable.

Frost Action
No indications of frost action were noted. Please see Other Features of Note below.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
Indications of re-vegetation were noted at several locations on the landfill, including: southwest, southeast, east and northeast side slopes; and the west cover area in the vicinity of VT-1. No areas of re-vegetation were noted during the previous 2010 inspection.

Staining
One small localized area of rust coloured staining was noted at the northeast toe of the landfill (Feature E). The staining was associated with an area of stagnant water ponded against the toe of the landfill. No direct seepage from the landfill was noted at the time of the inspection.

Seepage Points
Isolated ponding was noted along the north side of the landfill and in lower lying areas further to the east with no evidence of direct seepage from the landfill noted.

Debris
A partially exposed metal drum (Feature F) was noted on the north facing slope of the landfill. The crushed drum was embedded in the landfill cover with a 0.4 m x 0.4 m area exposed at surface, consistent with findings from the previous 2010 inspection.

Presence/Condition of Monitoring Instruments
All monitoring well and thermistor installations were found to be in good condition at the facility.

Other Features of Note
Several thin to medium sized tension cracks were noted extending perpendicular to the southwest (Feature G) and east (Feature H) facing slopes of the landfill. The cracks noted along the southwest and east facing slope appear to have increased in frequency and magnitude than previously observed in 2010 with widths up to 10 mm and 15 mm, respectively. Most cracks on the southwest slope were observed along the bottom 4 to 8 m of the slope, whereas the cracks on the east slope were noted along the bottom 4 to 10 m of the slope.

Discussion
The USAF Landfill performance with respect to containment of the debris within the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawings, is presented in the following pages.

Table XXIII: Visual Inspection Checklist / Report – USAF Landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 OF 2

SITE NAME: CAM-3 Shepherd Bay
LANDFILL DESIGNATION: USAF Landfill (Leachate Containment Landfill)
DATE OF INSPECTION: August 15, 2011
DATE OF PREVIOUS INSPECTION: August 17-18, 2010
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: CAM-3 Shepherd Bay
Landfill: USAF Landfill
Designation: Leachate Containment Landfill
Date Inspected: August 15, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature: 

CAM-3 USAF Landfill

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure CAM-3.7 (east and southeast slopes) 1 New Obs..	0.4 - 5 m	0.2 - 3 m	5 - 15 cm	Occasional (<1%)	Minor surface depressions	USAF-45, 53, 54	Acceptable	Three minor surface depressions on east and southeast side slopes. New observation below east crest associated with erosion feature.
		FEATURE B See Figure CAM-3.7 (central and southwest cover) New Obs..	3 - 6 m	1 - 1.5 m	2 - 10 cm	Isolated	Minor surface depressions	USAF-58, 59	Acceptable	Two subtle surface depressions on cental and southwest cover areas.
Erosion	Yes	FEATURE C See Figure CAM-3.7 (south and east slopes)	15 - 25 m	0.1 - 0.5 m	2 - 10 cm	Occasional (<1%)	Minor surface erosion	USAF-41, 50, 51, 55	Acceptable	Surface runoff has resulted in erosion of three localized channels on the south and east slopes of the landfill. Slope appears stable and self armouring.
		FEATURE D See Figure CAM-3.7 (northeast toe) New Obs.	15 m	0.5 - 1 m	1 - 2 cm	Isolated	N/A	USAF-27	Acceptable	Minor washing of fines alongnortheast toe. Not in direct contact with landfill.
Frost Action	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Vegetation	Yes	See Figure CAM-3.7 (west cover, southwst and east slopes) New Obs.	10 - 30 m	5 - 10 m	N/A	Occasional (3%)	Sparsely vegetated areas	USAF-1, 30, 45, 48, 50, 51, 53, 54, 57	N/A	N/A
Staining	Yes	FEATURE E See Figure CAM-3.7 (northeast toe) New Obs.	1 m	1 m	Unknown	Isolated	Localized rust coloured staining at toe	USAF-26	Acceptable	Associated with localized ponding along northeast toe.
Vegetation Stress	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	Not Observed	N/A	N/A	N/A	N/A
Debris Exposed	Yes	FEATURE F See Figure CAM-3.7 (north slope)	0.4 m	0.4 m	Unknown	Isolated	Crushed metal drum	USAF-56, 57	Acceptable	Partially exposed on slope.
Presence/Condition of Monitoring Instruments	Yes	See Figure CAM 3.7	N/A	N/A	N/A	Not Observed	VT-1 to VT-4 and MW-12 to MW-15	USAF-1, 2, 3, 4 and 12W, 13W, 14W, 15W	Acceptable	The protective casings at all locations were in good condition. Data downloaded from all thermistors.
Other Features of Note:	Yes	FEATURE G See Figure CAM-3.7 (south slope) Some New Obs.	6 - 30 m	2 - 15 mm	Unknown	Occasional (<2%)	Numerous parallel tension cracks extending across slope	USAF-30 to 40, 42 to 44	Acceptable	Frequency and magnitude of cracks appear to have increased from 2010 observations. Cracks generally extend along bottom 4-8 m of slope.
		FEATURE H See Figure CAM-3.7 (east slope) Some New Obs.	12 - 18 m	3 - 10 mm	Unknown	Occasional (<1%)	Single and parallel tension cracks extending across slope	USAF-46 to 48, 52, 53	Acceptable	Frequency and magnitude of cracks appear to have increased from 2010 observations. Cracks generally extend along bottom 4-10 m of slope.
		See Figure CAM-3.7 (northeast toe)	60 m	10 m	Unknown	N/A	Ponding along northeast toe	USAF-21, 22, 23	Acceptable	Not in contact with landfill.
Additional Photos	Yes	See Figure CAM-3.7 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

8.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the USAF Landfill has been completed as per the ToR and is included as Table XXIV hereafter.

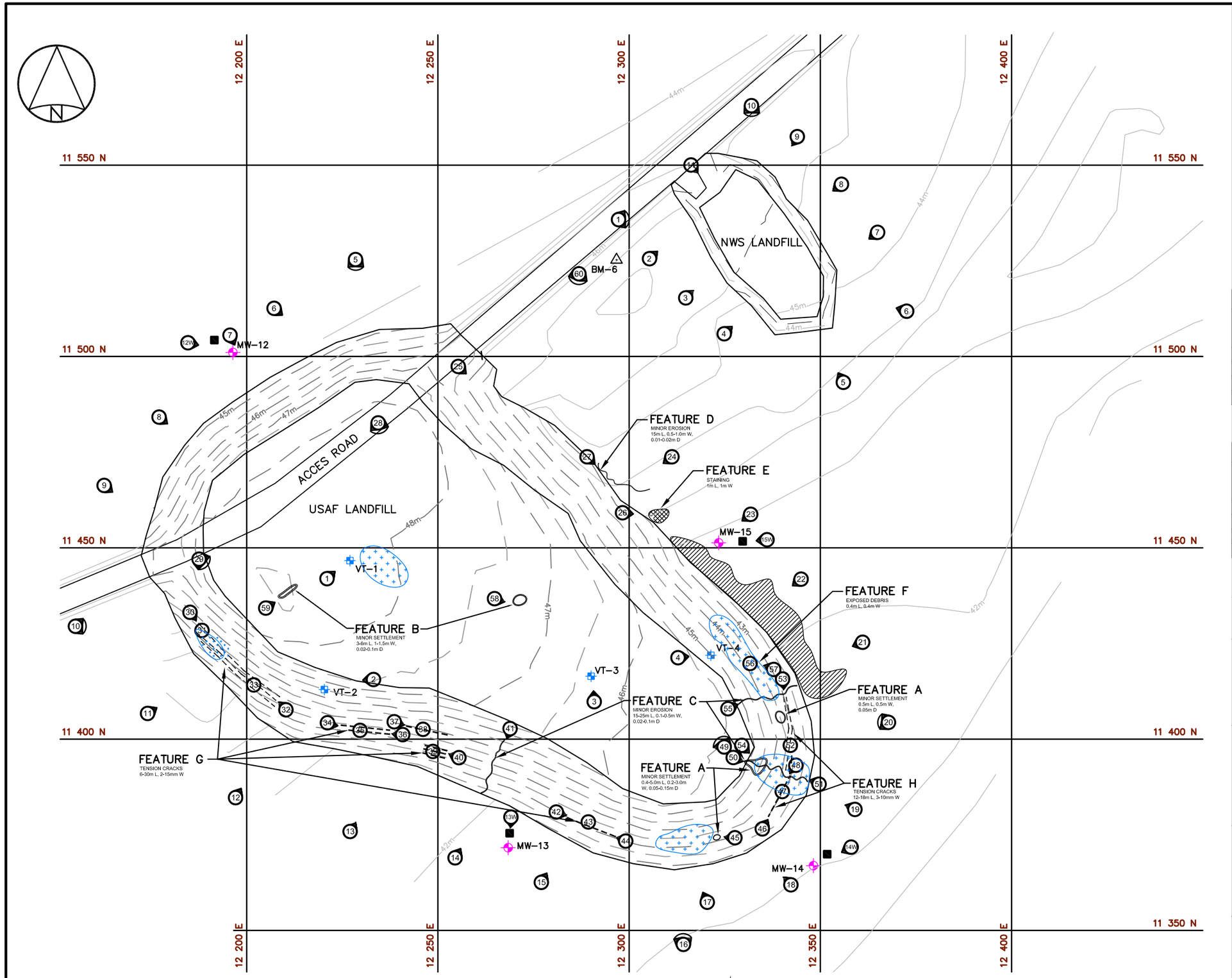
Table XXIV: Preliminary Stability Assessment – USAF Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.
Extent	**Description**
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

8.4 LOCATION PLAN

The Location Plan for the USAF Landfill has been completed as per the ToR and is presented in Figure CAM-3.7.



LEGEND

- CM27 — SURVEY CONTROL MONUMENT
- MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION
- PICTURE NUMBER VIEWPOINT (NWS)
- PICTURE NUMBER VIEWPOINT (USAF)
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (VARIOUS WIDTH)
- STAINING
- PONDING
- VEGETATION

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	P.L.	A.P.	P.G.
A	FINAL	12–01–26	PAR	VERIF.	APPR.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

USAF AND NWS LANDFILLS

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	JANUARY 2012
DRAWN BY:	VERIFIED BY:	APPROVED BY:
P. LÉGARÉ	A. PASSALIS	P. GÉLINAS
PROJECT NO:	DRAWING NO:	PAGE
CD9229_002_160	CD9229_002_160-CAM-3_7	PL

FIGURE CAM-3.7

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8.5 PHOTOGRAPHIC RECORDS

The Photographic Record for the USAF Landfill has been completed as per the ToR and is included as Table XXV hereafter. The Photographic Record only contains an index and “thumbnail” photographs. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XXV: Landfill Visual Inspection Photo Log – USAF Landfill

LANDFILL VISUAL INSPECTION PHOTO LOG
Site Name: CAM-3, Shepherd Bay
Landfill: USAF Landfill
Date Inspected: August 15, 2011
Inspected by: Andrew Passalis, P.Eng.
EGE Engineering Ltd.

Photo (USAF-)	Thumbnail	Filename	Date	Vantage Point		Caption
				Easting	Northing	
1		C311_4331	2011-08-15	12221	11442	View looking NE at VT-1. NWS Landfill in background.
2		C311_4332	2011-08-15	12233	11416	View looking W at VT-2
3		C311_4333	2011-08-15	12291	11410	View looking N at VT-3
4		C311_4334	2011-08-15	12313	11422	View looking E at VT-4. NWS Landfill in background.
5		C311_4335	2011-08-15	12228	11526	Panoramic view looking SE to SW from northeast of USAF Landfill
6		C311_4336	2011-08-15	12207	11512	View looking SE at northwest side of landfill
7		C311_4337	2011-08-15	12196	11505	View looking SE at northwest side of landfill
8		C311_4338	2011-08-15	12177	11484	View looking SE at northwest side of landfill
9		C311_4339	2011-08-15	12163	11466	View looking SE at northwest side of landfill
10		C311_4340	2011-08-15	12155	11430	Panoramic view looking NE to SE from access road west of landfill
11		C311_4341	2011-08-15	12174	11407	View looking NE at southwest side of landfill
12		C311_4342	2011-08-15	12197	11385	View looking NE at southwest side of landfill. VT-2 visible on right.
13		C311_4343	2011-08-15	12228	11376	View looking NE at southwest side of landfill. VT-2 visible on left
14		C311_4344	2011-08-15	12254	11369	View looking NE at southwest side of landfill. MW-13 location visible in center.
15		C311_4345	2011-08-15	12278	11362	View looking N at south side of landfill

Table XXV (Continued): Landfill Visual Inspection Photo Log – USAF Landfill

16		C311_4346	2011-08-15	12314	11346	Panoramic view looking NW to NE from southeast of landfill
17		C311_4347	2011-08-15	12321	11358	View looking NNW at south side of landfill
18		C311_4348	2011-08-15	12343	11362	View looking NW at southeast side of landfill
19		C311_4349	2011-08-15	12359	11382	View looking WNW at southeast side of landfill. Note vegetation on side slope.
20		C311_4350	2011-08-15	12368	11404	Panoramic view looking SW to NW from southeast of landfill
21		C311_4351	2011-08-15	12361	11426	View looking SW at northeast side of landfill. VT-4 visible on right.
22		C311_4352	2011-08-15	12345	11441	View looking SW at northeast side of landfill. VT-4 visible in center.
23		C311_4353	2011-08-15	12332	11459	View looking SW at northeast side of landfill. MW-15 visible center foreground.
24		C311_4354	2011-08-15	12312	11475	View looking SW at northeast side of landfill. VT-3 visible on far left.
25		C311_4355	2011-08-15	12255	11498	View looking SE along northeast toe of landfill. VT-4 visible in center background
26		C311_4356	2011-08-15	12299	11459	View looking E at rust coloured ponded area at northeast toe (1m L, 1m W) - FEATURE E
27		C311_4357	2011-08-15	12289	11474	View looking SE at minor erosion of fines along northeast toe (15m L, 0.5-1m W, 1-2cm D) - FEATURE D
28		C311_4359	2011-08-15	12234	11482	Panoramic view looking SE to SW across surface from northeast corner of landfill
29		C311_4360	2011-08-15	12187	11447	Panoramic view looking E to S from northwest corner of landfill. VT-1 visible in center background.
30		C311_4361	2011-08-15	12185	11433	View looking SE at cracks extending along west side of landfill (25-30m L, 3-10mm W) - FEATURE G

Table XXV (Continued): Landfill Visual Inspection Photo Log – USAF Landfill

31		C311_4362	2011-08-15	12188	11428	View of crack extending along west side of landfill (3-10mm W) - FEATURE G
32		C311_4363	2011-08-15	12210	11408	View looking NW at cracks extending along west side of landfill (25-30m L, 3-10mm W) - FEATURE G
33		C311_4364	2011-08-15	12202	11414	View of 3 parallel cracks extending along west side of landfill (25-30m L, 3-10cm W) - FEATURE G
34		C311_4365	2011-08-15	12223	11403	View looking ESE at single crack extending along south side slope of landfill (15m L, 2-5mm W) - FEATURE G
35		C311_4366	2011-08-15	12231	11402	View of crack extending along south side slope of landfill (15m L, 2-5mm W) - FEATURE G
36		C311_4367	2011-08-15	12242	11401	View looking W at 2 cracks extending along south side slope of landfill (10-15m L, 2-5mm W) - FEATURE G
37		C311_4368	2011-08-15	12239	11405	View looking ESE at single crack extending along south side slope of landfill (10m L, 1-3mm W) - FEATURE G
38		C311_4369	2011-08-15	12247	11402	View of crack extending along south side slope of landfill (10m L, 1-3mm W) - FEATURE G
39		C311_4370	2011-08-15	12250	11396	View of cracks extending along south side slope of landfill (6m L, 2-15mm W) - FEATURE G
40		C311_4371	2011-08-15	12256	11395	View looking W at 3 cracks extending along south side slope of landfill (6m L, 2-15mm W) - FEATURE G
41		C311_4372	2011-08-15	12269	11403	View looking SW at minor erosion on southwest slope of landfill (15m L, 0.5m W, 2-3cm D) - FEATURE C
42		C311_4373	2011-08-15	12281	11380	View looking SE at single crack extending along south slope of landfill (14m L, 2-3mm W) - FEATURE G
43		C311_4374	2011-08-15	12289	11379	View of crack extending along south sloope of landfill (14m L, 2-3mm W) - FEATURE G
44		C311_4375	2011-08-15	12299	11373	View looking NW at single crack extending along south side of landfill (8m L, 2-5mm W) - FEATURE G
45		C311_4376	2011-08-15	12328	11375	View looking W at minor depression (0.4m L, 0.2m W, 5-7cm D) - FEATURE A

Table XXV (Continued): Landfill Visual Inspection Photo Log – USAF Landfill

46		C311_4377	2011-08-15	12335	11376	View looking NE at single crack extending across southeast side slope (12m L, 3-5mm W) - FEATURE H
47		C311_4378	2011-08-15	12340	11387	View of single crack extending across southeast side slope (12m L, 3-5mm W) - FEATURE H
48		C311_4379	2011-08-15	12344	11393	View looking SW at single crack extending across southeast side slope (12m L, 3-5mm W) - FEATURE H
49		C311_4380	2011-08-15	12327	11393	Panoramic view looking W to NE across surface from southeast end of landfill
50		C311_4381	2011-08-15	12329	11394	View looking SE at minor erosion on east side slope of landfill (25m L, 0.1-0.2m W, 5-10cm D) - FEATURE C
51		C311_4382	2011-08-15	12350	11388	View looking NW at minor erosion on east side slope of landfill (25m L, 0.1-0.2m W, 5-10cm D) - FEATURE C
52		C311_4385	2011-08-15	12342	11399	View of cracks extending along east side slope of landfill (18m L, 3-10mm W) - FEATURE H
53		C311_4386	2011-08-15	12341	11415	View looking S at cracks extending along east side slope of landfill (18m L, 3-10mm W) - FEATURE H. Also note small depression on right (0.5m L, 0.5m W, 5cm D) - FEATURE A
54		C311_4388	2011-08-15	12329	11401	View looking SE at subtle depression on east side slope below crest (4-5m L, 3m W, 15cm D) - FEATURE A
55		C311_4389	2011-08-15	12326	11408	View looking ENE at minor erosion extending along east side slope of landfill (15m L, 0.1-0.15m W, 5cm D) - FEATURE C
56		C311_4390	2011-08-15	12332	11420	Partially exposed metal debris (crushed drum) on east side slope below VT-4 - FEATURE F
57		C311_4391	2011-08-15	12338	11418	View looking WNW at partially exposed metal debris (crushed drum) on east side slope below VT-4 - FEATURE F
58		C311_4392	2011-08-15	12265	11436	View looking E at subtle depression on central cover area of landfill (3m L, 1.5m W, 10-15cm D) - FEATURE B
59		C311_4394	2011-08-15	12203	11433	View looking NE at linear depression on southwest cover area of landfill (6m L, 1m W, 10cm D) - FEATURE B
60		C311_4397	2011-08-15	12287	11522	Panoramic View looking SE to SW at USAF Landfill from service road adjacent to NWS Landfill

Table XXV (Continued): Landfill Visual Inspection Photo Log – USAF Landfill

		C311_4759	2011-08-15	12050	11510	Aerial view looking SE at USAF Landfill
		C311_4761	2011-08-15	12640	11600	Aerial view looking SW at USAF and NWS Landfills
Soil Sampling						
MW-12		C311_4320	2011-08-15	12192	11504	Sampling location C311-12W located upgradient of USAF LF
12W		C311_4321	2011-08-15	12184	11504	View looking E at MW-12 soil sample location
MW-13		C311_4323	2011-08-15	12269	11376	Sampling location C311-13W located downgradient of USAF LF
13W		C311_4324	2011-08-15	12269	11381	View looking S at MW-13 soil sample location
MW-14		C311_4326	2011-08-15	12352	11370	Sampling location C311-14W located downgradient of USAF LF
14W		C311_4327	2011-08-15	12358	11371	View looking SW at MW-14 soil sample location
MW-15		C311_4329	2011-08-15	12330	11452	Sampling location C311-15W located downgradient of USAF LF
15W		C311_4330	2011-08-15	12336	11452	View looking W at MW-15 soil sample location

8.6 THERMAL MONITORING DATA

All thermistors installed at the USAF Landfill were inspected and found to be in good condition with no significant concerns identified. Data from all thermistors was successfully retrieved with the exception of VT-3 which encountered a clock error at the onset of monitoring in August 2010. Consequently, limited termperature data was recorded for the 2010-2011 period. Further review of the downloaded data identified no errors in temperature readings. All analogues/thermocouples were found to be properly functioning at the time of the inspection. Where possible, internal memories were reset and clocks were synchronized using the Prolog software. Good battery levels were noted at the remaining three datalogger units VT-5, VT-7 and VT-8.

The datalogger battery level at VT-3 was noted as “fair” at the time of the 2011 inspection and should be replaced during the next monitoring event, scheduled for 2012. All other datalogger battery levels at VT-1, VT-2 and VT-4 were noted as good and did not require replacement.

8.7 LANDFILL TEMPERATURE DATA FROM DATALOGGERS

Manual resistive and temperature data readings were collected from the thermistor strings as per the ToR. Manual readings and inspection results for each thermistor are presented in the Thermistor Annual Maintenance Reports included in the report. A complete datalogger RAW data set for the 2010-2011 period has been forwarded to DCC as per the ToR.

8.8 SOIL SAMPLE ANALYTICAL DATA

The soil chemical analysis results and the evaluation of the analytical data for the 2011 USAF Landfill samples are presented in Tables XXVI and XXVII below. Field and inter-laboratory duplicates collected as part of the QA/QC program are presented in Appendix C at the end of this report.

Table XXVI: Soil Chemical Analysis Results – Metals and PCBs – USAF Landfill

Sample Name	Location	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]
C311-12WA	MW-12	0-15	<5	2	2	<0.1	2	<10	5	<1	<0.05	<0.010
C311-12WB		40-50	<5	2	1	<0.1	1	<10	3	<1	<0.05	<0.010
C311-13WA	MW-13	0-15	<5	3	2	<0.1	3	<10	6	1	<0.05	<0.010
C311-13WB		40-50	<5	3	2	<0.1	3	<10	5	2	<0.05	<0.010
C311-14WA	MW-14	0-15	15	3	3	<0.2	3	66	4	<2	<0.1	<0.061
C311-14WB		40-50	6	5	4	<0.1	5	18	9	2	<0.05	<0.010
C311-15WA	MW-15	0-15	9	2	1	<0.1	2	<10	2	1	<0.05	<0.010
C311-15WB		40-50	14	2	1	<0.1	2	<10	4	2	0.05	<0.010
C311-BD1 (15 WB)		40-50	<5	3	2	<0.1	3	<10	6	3	<0.05	<0.010

S/P/CD/9229/CAM-1/2011/T/Analysis.xls

Table XXVII: Soil Chemical Analysis Results – PHCs and BTEX – USAF Landfill

Sample Name	Sample Location	Depth Below Grade [cm]	Parameters						
			Benzene [mg/kg]	Toluene [mg/kg]	Ethylbenzene [mg/kg]	Xylenes [mg/kg]	PHC(F1) [mg/kg]	PHC(F2) [mg/kg]	PHC(F3) [mg/kg]
C311-12WA	MW-12	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-12WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-13WA	MW-13	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-13WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-14WA	MW-14	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<60 (1)	<60 (1)
C311-14WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-15WA	MW-15	0-15	<0.0050	<0.020	<0.010	<0.040	<12	<10	12
C311-15WB		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10
C311-BD1 (15 WB)		40-50	<0.0050	<0.020	<0.010	<0.040	<12	<10	<10

PHC (F1): Petroleum hydrocarbon C_6 to C_{10}, does not include BTEX fractions
PHC (F2): Petroleum hydrocarbon $C_{>10}$ to C_{16}
PHC (F3): Petroleum hydrocarbon $C_{>16}$ to C_{34}
(1): Detection limit raised due to high moisture content

S/P/CD/9229/CAM-1/2011/T/Analysis.xls

Table XXVIII: Evaluation of 2011 Soil Analytical Data – USAF Landfill

Parameter	2011
Copper	Concentrations ranged between <5-15 mg/kg with detectable concentrations noted at downgradient locations MW-14 and MW-15 (surface and depth) only. The highest concentration was observed at surface at MW-14 (15 mg/kg) and at depth at MW-15 (14 mg/kg). Detectable concentrations between 6-9 mg/kg were noted at the other locations.
Nickel	Concentrations ranged between 2-5 mg/kg with a mean of 2.8. The most elevated concentration was observed at depth in MW-14 (downgradient location). Concentrations between 2-3 mg/kg were noted at all other sample locations.
Cobalt	Concentrations ranged between 1-4 mg/kg with a mean of 2.0. The highest concentrations were observed at surface (3 mg/kg) and depth (4 mg/kg) at MW-14 (downgradient location). Concentrations between 1-2 mg/kg were noted at all other sample locations.
Cadmium	All reported concentrations were less than the method detection limits of 0.1 mg/kg or 0.2 mg/kg (MW-14 surface sample only).
Lead	Concentrations ranged between 1-5 mg/kg with a mean of 2.6. The highest concentrations were noted at downgradient locations MW-14 (3 mg/kg, surface and 5 mg/kg, depth) and MW-13 (3 mg/kg, surface and depth). Concentrations between 1-2 mg/kg were noted at all other locations.
Zinc	Elevated concentrations of 66 mg/kg and 18 mg/kg were noted at surface and depth locations at MW-14 (downgradient location). All other concentrations were less than the method detection limit of 10 mg/kg.
Chromium	Concentrations ranged between 2-9 mg/kg with a mean of 4.8. The most elevated concentrations were observed at downgradient locations MW-13 (6 mg/kg, surface) and MW-14 (9 mg/kg, depth). Concentrations between 2-5 mg/kg were noted at all other sample locations.
Arsenic	Concentrations ranged between <1-2 mg/kg with detectable concentrations of 2 mg/kg noted at depth at each of the downgradient locations MW-13, MW-14 and MW-15.
Mercury	All reported concentrations were less than the method detection limits of 0.05 mg/kg or 0.1 mg/kg (MW-14 surface sample only).
PCBs	All reported concentrations were less than the method detection limits of 0.01 mg/kg) and 0.061 mg/kg ((MW-14 surface sample only).
TPH	All reported concentrations were less than the method detection limits of 12 mg/kg or 60 mg/kg (MW-14 surface sample only), with the exception of the surface sample at MW-15 which reported trace concentrations of the F3 Fraction of 12 mg/kg.

8.9 GROUNDWATER SAMPLE ANALYTICAL DATA

The groundwater chemical analysis results and the evaluation of analytical data for the 2011 USAF Landfill samples are presented in Tables XXIX and XXX. As noted above, MW-12 (upgradient location) was dry at the time of monitoring and consequently no groundwater samples were collected at this location. Groundwater samples collected as part of the QA/QC program are presented in Appendix C at the end of the report.

Table XXIX: Groundwater Chemical Analysis Results – USAF Landfill

Sample Name	Location	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [ug/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [ug/L]	PCBs [mg/L]	TPH [mg/L]
C311-13W	MW-13	0.012	0.028	0.0040	0.000070	0.0062	0.12	0.038	0.0048	0.14 (1)	<0.000050	<2
C311-14W	MW-14	0.13	0.11	0.014	0.00029	0.036	0.32	0.092	0.017	0.059 (1)	<0.000050	<2
C311-15W	MW-15	0.022	0.041	0.0072	0.00025	0.011	0.14	0.076	0.0079	0.013	<0.000050	<2
C311-BDW1	MW-15	0.026	0.056	0.0099	0.00024	0.015	0.12	0.11	0.011	0.003	<0.000050	<2
C311-FB	N/A	<0.0002	<0.0005	<0.0003	<0.000005	<0.0002	<0.003	<0.001	<0.0002	0.004	<0.000050	<2
C311-TB	N/A	<0.0002	<0.0005	<0.0003	<0.000005	<0.0002	<0.003	<0.001	<0.0002	0.004	<0.000050	<2

(1):Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

S/P/CD/9229/CAM-1/2011/T/Analysis.xls

Table XXX: Evaluation of 2011 Groundwater Analytical Data – USAF Landfill

Parameter	2011
Copper	Concentrations ranged between 0.012-0.13 mg/L, with the most elevated concentration noted at downgradient location MW-14, approximately one order of magnitude greater than the other two downgradient sample locations.
Nickel	Concentrations ranged between 0.028-0.11 mg/L, with the highest and lowest concentrations noted at MW-14 and MW-13, respectively. The concentration at MW-14 is 2.5-4x greater than the other two downgradient sample locations.
Cobalt	Concentrations ranged between 0.0040-0.014 mg/L, with the highest and lowest concentrations noted at MW-14 and MW-13, respectively. The concentration at MW-14 is 2-3.5x greater than the other two downgradient sample locations.
Cadmium	Concentrations ranged between 0.00007-0.00029 mg/L. The highest and lowest concentrations were noted at MW-14/MW-15 and MW-13, respectively. The concentrations at MW-14 and MW-15 are approximately 4x greater than the other downgradient sample location MW-13.
Lead	Concentrations ranged between 0.0062-0.036 mg/L, with elevated concentrations noted at MW-14, approximately 3-6x greater than the other two downgradient sample locations.
Zinc	Concentrations ranged between 0.12-0.32 mg/L, with the highest and lowest concentrations noted at MW-14 and MW-13, respectively. The concentration at MW-15 also reported a relatively low concentration of 0.14 mg/L.
Chromium	Concentrations ranged between 0.038-0.092 mg/L, with the highest concentration observed at MW-14, approximately 1.2-2.4x higher than the two other downgradient sample locations.
Arsenic	Concentrations ranged between 0.0048-0.017 mg/L, with the highest and lowest concentrations noted at MW-14 and MW-13, respectively. The concentration at MW-14 is approximately 2-3.5x greater than the other two downgradient sample locations.
Mercury	Concentrations ranged between 0.000013-0.000059 mg/L, with detectable concentrations noted at all locations. The highest concentration was noted at MW-14, approximately 4x greater than the other two downgardient sample locations. The detection limits were raised in all samples due to dilution in order to bring the analyte within the calibrated range.
PCBs	All reported concentrations were less than the method detection limit (0.00005 mg/L).
TPH	All reported concentrations were less than the method detection limit (0.2 mg/L).

8.10 THERMISTOR ANNUAL MAINTENANCE REPORTS

The thermistor annual maintenance reports for VT-1 to VT-4 are presented in this section.

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**			Inspection Date:			**2011-08-15**
Prepared By:	**A.Passalis**						
Thermistor Information							
Site Name:	**CAM-3**	Thermistor Location		**USAF Landfill**			
Thermistor Number:	**VT-1**	Inclination		**Vertical**			
Install Date:	**08/18/2007**	First Date Event		**05-08-2008**	Last Date Event		**2010-08-17**
Coordinates and Elevation		N **11447**		E **12226,9**		Elev	**48,8**
Length of Cable (m)	**5,8**	Cable Lead Above Ground (m)	**3,10**	Nodal Points			**6**
Datalogger Serial #	**09100123 (replaced #02020211 in 2010)**			Cable Serial Number			

Thermistor Inspection

	Good	Needs Maintenance
Casing	**Yes**	**No**
Cover	**Yes**	**No**
Data Logger	**Yes**	**No**
Cable	**Yes**	**No**
Beads	**Yes**	**No**
Battery Installation Date	**2010-07-01**	
Battery Levels	Main **11,34**	Aux **12,77**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	11,980	5,7279			
2	10,791	8,0463			
3	11,477	7,1069			
4	12,941	4,7274			
5	16,242	0,1456			
6	17,658	-1,3689			

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-15**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**	Thermistor Location		**USAF Landfill**			
Thermistor Number:	**VT-2**	Inclination		**Vertical**			
Install Date:	**08/18/2007**	First Date Event		**05-08-2008**	Last Date Event		**2010-08-17**
Coordinates and Elevation	N	**11412,9**	E	**12220,3**		Elev	**46,6**
Length of Cable (m)	**6,7**	Cable Lead Above Ground (m)	**3,05**	Nodal Points			**8**
Datalogger Serial #	**02020216**			Cable Serial Number			

Thermistor Inspection

	Good	Needs Maintenance
Casing	**Yes**	**No**
Cover	**Yes**	**No**
Data Logger	**Yes**	**No**
Cable	**Yes**	**No**
Beads	**Yes**	**No**
Battery Installation Date	**08/19/2010**	
Battery Levels	Main **11,34**	Aux **13,02**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	12,603	5,2588			
2	11,337	7,4022			
3	11,846	6,5344			
4	13,785	3,3743			
5	16,138	0,3834			
6	17,293	-0,9626			
7	18,263	-1,9823			
8	19,358	-3,1234			

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-15**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**	Thermistor Location		**USAF Landfill**			
Thermistor Number:	**VT-3**	Inclination		**Vertical**			
Install Date:	**08/18/2007**	First Date Event		**05-08-2008**	Last Date Event		**2010-08-17**
Coordinates and Elevation	N	**11416,6**	E	**12289,8**		Elev	**46,4**
Length of Cable (m)	**6,8**	Cable Lead Above Ground (m)	**3,10**	Nodal Points			**8**
Datalogger Serial #	**02020213**			Cable Serial Number			

Thermistor Inspection

	Good	Needs Maintenance	
Casing	**Yes**	**No**	
Cover	**Yes**	**No**	
Data Logger	**No**	**Yes**	Batteries should be replaced in 2012.
Cable	**Yes**	**No**	
Beads	**Yes**	**No**	
Battery Installation Date	**08/18/2008**		
Battery Levels	Main **11,34**	Aux	**11,92** (fair)

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	12,547	5,4085			
2	11,602	6,9268			
3	12,526	5,4184			
4	14,318	2,7191			
5	16,402	0,1000			
6	17,484	-1,1439			
7	18,771	-2,5034			
8	21,22	-4,8895			

Observations and Proposed Maintenance

Recommend battery replacement during next inspection period (2012).

Bad data error message during downloading. "The logger clock date reading was invalid. The time display may be inaccurate."

Complete memory dump performed.

Thermistor Annual Maintenance Report

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2011-08-15**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**CAM-3**	Thermistor Location		**USAF Landfill**			
Thermistor Number:	**VT-4**	Inclination		**Vertical**			
Install Date:	**08/19/2007**	First Date Event		**05-08-2008**	Last Date Event		**2010-08-17**
Coordinates and Elevation	N	**11422,1**	E	**12321,3**		Elev	**45,1**
Length of Cable (m)	**6,5**	Cable Lead Above Ground (m)	**2,90**	Nodal Points			**8**
Datalogger Serial #	**00207019**			Cable Serial Number			

Thermistor Inspection

	Good	Needs Maintenance
Casing	**Yes**	**No**
Cover	**Yes**	**No**
Data Logger	**Yes**	**No**
Cable	**Yes**	**No**
Beads	**Yes**	**No**
Battery Installation Date	**2010-06-01**	
Battery Levels	Main **11,34**	Aux **12,17**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	12,852	4,9045			
2	12,318	5,6904			
3	11,843	6,2121			
4	13,881	3,3443			
5	15,968	0,6033			
6	17,25	-0,8835			
7	18,318	-2,0776			
8	19,248	-3,0037			

Observations and Proposed Maintenance

8.11 MONITORING WELL SAMPLING/INSPECTION LOGS

The monitoring well sampling and inspection logs for MW-12 to MW-15 are included in this section.

2011 Monitoring Well Sampling Log (MW-12)

Site name:	CAM-3				
Date of sampling event:	15-Aug-11				
Names of samplers:	Andrew Passalis				
Monitoring well ID:	MW-12				
Facility:	USAF Landfill				
Known Data					
Depth of installation* (m):	3,53				
Length of screened section (m):	2,00				
Depth to top of screen* (m):	0,53				
Measured Data					
Condition of well:	Good		Procedure/Equipment:	Interface Meter	
Procedure/Equipment:	Measuring Tape		Depth to water surface (m):	- (dry)	
Well height above ground (m):	0,39		Depth to bottom (m):	1,44	
Diameter of well (m):	0,04		Free product thickness (mm):	-	
Calculations			**Notes**		
Depth of water (m):	-		Evidence of sludge:	no	
Well volume of water (L):	-		Evidence of freezing/siltation:	no	
Static water level* (m):	-				
Length of screen collecting water (m):	-				
Development/Purging Information					
Equipment:	n/a				

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
-	-	-	-	-	-	-

Water Sampling		**Soil Sampling**	
Date & Time Collected:		Date and Time Collected:	15-Aug-11
Sample Number - Water:		Sample Number - Soil:	C311-12WA
			C311-12WB
Sample Containers:		Sample Containers:	3x125mL glass
			3x125mL glass
Procedure/Equipment:		Procedure/Equipment:	Steel & Plastic Trowels
Water Description:		Soil Description:	Brown sand, med.gr.
			some organics to 0-15
			some gravel, damp
Sampling Equipment Decontamination (Y/N):	n/a	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

2011 Monitoring Well Sampling Log (MW-13)

Site name:	CAM-3
Date of sampling event:	15-Aug-11
Names of samplers:	Andrew Passalis
Monitoring well ID:	MW-13
Facility:	USAF Landfill

Known Data

Depth of installation* (m):	3,60
Length of screened section (m):	2,00
Depth to top of screen* (m):	0,60

Measured Data

Condition of well:	Good	Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape	Depth to water surface (m):	1,10
Well height above ground (m):	0,31	Depth to bottom (m):	1,77
Diameter of well (m):	0,04	Free product thickness (mm):	-

Calculations		Notes	
Depth of water (m):	0,67	Evidence of sludge:	no
Well volume of water (L):	0,72	Evidence of freezing/siltation:	no
Static water level* (m):	0,79		
Length of screen collecting water (m):	0,67		

Development/Purging Information

Equipment: Dedicated waterra tubing and foot valve

Date & Time	Volume Removed (L)	Temperature (°C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
15-Aug-11	1,5	2,5	9,1	4254	34	sl.grey, N/O

Water Sampling		Soil Sampling	
Date & Time Collected:	15-Aug-11	Date and Time Collected:	15-Aug-11
Sample Number - Water:	C311-13W	Sample Number - Soil:	C311-13WA
	C311-13W (Inter Dup.)		C311-13WB
Sample Containers:	3x500mL, 1x250 mL plastic	Sample Containers:	3x125mL glass
	2x1L glass, 1x250 plastic		3x125mL glass
	3x40mL vials		
Procedure/Equipment:	Waterra tubing & foot valve Hanna HI9828 Mulitmeter, Hach 2100P Turbidimeter	Procedure/Equipment:	Steel & Plastic Trowels
Water Description:	sl.grey, N/O	Soil Description:	Brown/grey sand
			med.gr., trace gravel,
			damp
Sampling Equipment Decontamination (Y/N):	N, dedicated	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

2011 Monitoring Well Sampling Log (MW-14)

Site name:	CAM-3
Date of sampling event:	15-Aug-11
Names of samplers:	Andrew Passalis
Monitoring well ID:	MW-14
Facility:	USAF Landfill

Known Data

Depth of installation* (m):	3,51
Length of screened section (m):	2,00
Depth to top of screen* (m):	0,51

Measured Data

Condition of well:	Good	Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape	Depth to water surface (m):	1,45
Well height above ground (m):	0,48	Depth to bottom (m):	1,66
Diameter of well (m):	0,04	Free product thickness (mm):	-

Calculations		Notes	
Depth of water (m):	0,21	Evidence of sludge:	no
Well volume of water (L):	0,23	Evidence of freezing/siltation:	no
Static water level* (m):	0,97		
Length of screen collecting water (m):	0,21		

Development/Purging Information

Equipment: Dedicated waterra tubing and foot valve

Date & Time	Volume Removed (L)	Temperature (°C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
15-Aug-11	0,5	1,93	8,4	2623	43	sl.grey, N/O

Water Sampling		Soil Sampling	
Date & Time Collected:	15-Aug-11	Date and Time Collected:	15-Aug-11
Sample Number - Water:	C311-14W	Sample Number - Soil:	C311-14WA
			C311-14WB
Sample Containers:	3x500mL, 1x250 plastic	Sample Containers:	3x125mL glass
			3x125mL glass
Procedure/Equipment:	Waterra tubing & foot valve Hanna HI9828 Mulitmeter, Hach 2100P Turbidimeter	Procedure/Equipment:	Steel & Plastic Trowels
Water Description:	sl.grey, N/O	Soil Description:	0-10 black org + silt
			10 - brown grey sand,
			med. gr., trace gravel
Sampling Equipment Decontamination (Y/N):	N, dedicated	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

2011 Monitoring Well Sampling Log (MW-15)

Site name:	CAM-3
Date of sampling event:	15-Aug-11
Names of samplers:	Andrew Passalis
Monitoring well ID:	MW-15
Facility:	USAF Landfill

Known Data

Depth of installation* (m):	3,43
Length of screened section (m):	2,00
Depth to top of screen* (m):	0,43

Measured Data

Condition of well:	Good	Procedure/Equipment:	Interface Meter
Procedure/Equipment:	Measuring Tape	Depth to water surface (m):	0,63
Well height above ground (m):	0,53	Depth to bottom (m):	1,77
Diameter of well (m):	0,04	Free product thickness (mm):	-

Calculations		Notes	
Depth of water (m):	1,14	Evidence of sludge:	no
Well volume of water (L):	1,23	Evidence of freezing/siltation:	no
Static water level* (m):	0,10		
Length of screen collecting water (m):	0,81		

Development/Purging Information

Equipment: Dedicated waterra tubing and foot valve

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Description of Water
15-Aug-11	1,8	1,8	7,9	2819	8,1	C&C, N/O

Water Sampling		Soil Sampling	
Date & Time Collected:	15-Aug-11	Date and Time Collected:	15-Aug-11
Sample Number - Water:	C311-15W	Sample Number - Soil:	C311-15WA
	C311-BDW1		C311-15WB + inter QA
			C311-BD1 (15WB)
Sample Containers:	3x500mL, 1x250 mL plastic	Sample Containers:	3x125mL glass
	3x500mL, 1x250 mL plastic		8x125mL glass
			3x125mL glass
Procedure/Equipment:	Waterra tubing & foot valve Hanna HI9828 Mulitmeter, Hach 2100P Turbidimeter	Procedure/Equipment:	Steel & Plastic Trowels
Water Description:	C&C, N/O	Soil Description:	0-20 Blk org & silt,
			20- grey sand, some
			silt
Sampling Equipment Decontamination (Y/N):	N, dedicated	Sampling Equipment Decontamination (Y/N):	Y
Number Washes:	0	Number Washes:	1
Number Rinses:	0	Number Rinses:	1

*From ground surface. Unless this is stated, all measurments are assumed to be from the top of the casing.
n/a=not applicable
SS=Stainless Steel
C&C = Clear & Colourless
N/O = No Odour

9 NWS LANDFILL

9.1 BACKGROUND AND MONITORING PROGRAM

The NWS Landfill is located east of the Winter Water Lake road approximately 60 m northeast of the USAF Landfill. With cover material, the single regrade area of the landfill encompasses a footprint of approximately 1,200 m^2 with the final cover extending approximately 0.75 m above the surrounding grade. Based on existing information regarding this landfill as a source of contamination, its potential migration pathways and receptors, the NWS Landfill was classified as low potential environmental risk. The remediation consisted in regrading with the placement of additional granular fill.

The long-term monitoring plan consists in visual monitoring and periodic collection of soil samples. The 2011 monitoring of this landfill includes a visual inspection and soil sample collection to assess landfill performance. There is no instrumentation installed at this landfill.

9.2 VISUAL INSPECTION REPORT

The visual inspection of the NWS Landfill was conducted on August 15, 2011. The Visual Inspection Checklist/Report has been completed as per the ToR and is included as Table XXXI of this report.

Settlement
No indications of settlement were noted.

Erosion
No indications of erosion were noted.

Frost Action
No evidence of frost action was noted.

Evidence of Burrowing Animals
No indications of burrowing animals were noted.

Re-establishment of Vegetation
No indications of vegetation were noted.

Staining
No areas of staining were observed at the time of the inspection.

Seepage Points
No seepage point was observed at this landfill.

Debris
No debris were noted.

Presence/Condition of Monitoring Instruments
No monitoring instrument is installed at this landfill.

Other Features of Note
There was no other feature of note.

Discussion

The NWS Landfill performance with respect to containment of the debris within the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawings is presented in the following pages.

Table XXXI: Visual Inspection Checklist / Report – NWS Landfill

DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST
INSPECTION REPORT – PAGE 1 of 2

SITE NAME: CAM-3 Shepherd Bay
LANDFILL DESIGNATION: NWS Landfill (Regrade Landfill)
DATE OF INSPECTION: August 16, 2011
DATE OF PREVIOUS INSPECTION: August 17, 2010
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

LANDFILL VISUAL INSPECTION

Site Name: CAM-3 Shepherd Bay
Landfill: NWS Landfill
Designation: Regrade Landfill
Date Inspected: August 15, 2011
Inspected by: Andrew Passalis, P.Eng.
Sila Remediation Inc.

Signature:

CAM-3 NWS LANDFILL

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Erosion	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Other Features of Note:	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observed	N/A
Additional Photos	Yes	See Figure CAM-3.7 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	N/A	General photos for documentation, no features of note.
Overall Landfill Performance:	**Acceptable**									

9.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the NWS Landfill has been completed as per the ToR and is included as Table XXXII hereafter.

Table XXXII: Preliminary Stability Assessment – NWS Landfill

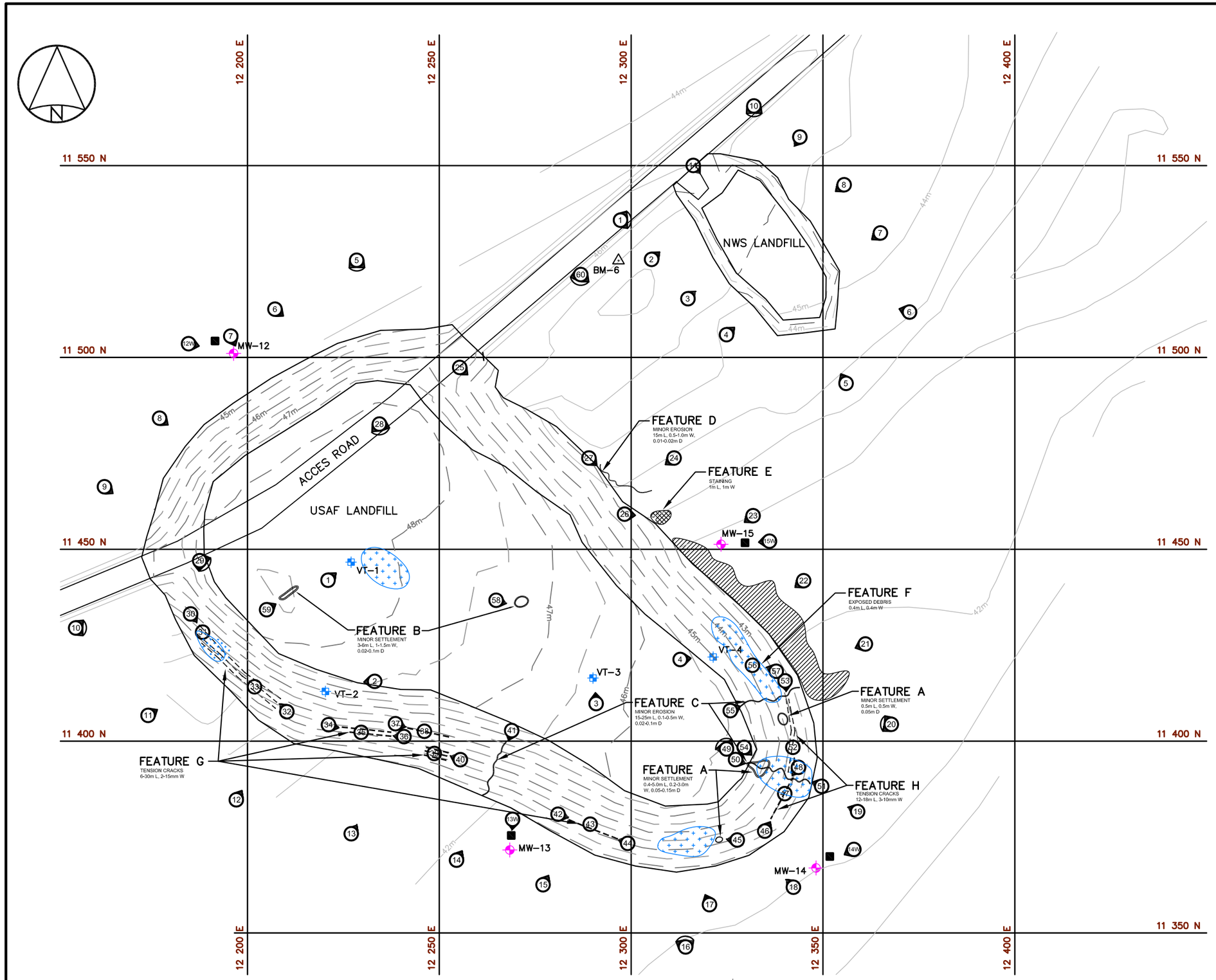
Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	**Acceptable**	

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of differential settlement. • Liner exposed. • Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50 % of the surface area of the landfill
Extensive	Impacting greater than 50 % of the surface area of the landfill

9.4 LOCATION PLAN

The Location Plan for the NWS Landfill has been completed as per the ToR and is presented in Figure CAM-3.7.



LEGEND

- CM27 — SURVEY CONTROL MONUMENT
- MONITORING WELL LOCATION
- VT — VERTICAL THERMISTOR
- MONITORING SOIL SAMPLE LOCATION
- PICTURE NUMBER VIEWPOINT (NWS)
- PICTURE NUMBER VIEWPOINT (USAF)
- SETTLEMENT (NTS)
- EROSION (NTS)
- CRACK (VARIOUS WIDTH)
- STAINING
- PONDING
- VEGETATION

0 10m 20m 30m 40m 50m

NO.	VERSION	DATE	P.L.	A.P.	P.G.
A	PRELIMINARY	12–01–26	PAR	VERIF.	APPR.

Construction de Défense Canada
Defence Construction Canada

FINAL REPORT
COLLECTION OF LANDFILL MONITORING DATA
CAM-3, SHEPHERD BAY, NUNAVUT

USAF AND NWS LANDFILLS

SITE REMEDIATION SOLUTIONS

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MEASUREMENT UNIT	SCALE:	DATE (month–year):
Meter	1 : 1,000	JANUARY 2012
DRAWN BY:	VERIFIED BY:	APPROVED BY:
P. LÉGARÉ	A. PASSALIS	P. GÉLINAS
PROJECT NO:	DRAWING NO:	PAGE
CD9229_002_160	CD9229_002_160-CAM-3_8	PL

FIGURE CAM-3.8

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9.1 PHOTOGRAPHIC RECORDS

The Photographic Record for the NWS Landfill has been completed as per the ToR and is included as Table XXXIII hereafter. The Photographic Record contains only an index and “thumbnail” photographs. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XXXIII: Landfill Visual Inspection Photo Log – NWS Landfill

Photo (NWS-)	Thumbnail	Filename	Date	Vantage Point		Caption
				Easting	Northing	
1		C311_4398	2011-08-15	12297	11535	Panoramic view looking SE to SW from access road northeast of NWS Landfill
2		C311_4399	2011-08-15	12305	11526	View looking NE at southwest side of NWS Landfill
3		C311_4400	2011-08-15	12315	11515	View looking NE at southwest side of NWS Landfill
4		C311_4401	2011-08-15	12325	11505	View looking NE at southwest side of NWS Landfill
5		C311_4403	2011-08-15	12356	11494	View looking NNW at southeast end of NWS Landfill
6		C311_4404	2011-08-15	12373	11512	View looking WNW at east end of NWS Landfill
7		C311_4405	2011-08-15	12365	11532	View looking SW at northeast side of NWS Landfill
8		C311_4406	2011-08-15	12356	11544	View looking SW at northeast side of NWS Landfill
9		C311_4407	2011-08-15	12345	11558	View looking SW at northeast side of NWS Landfill
10		C311_4408	2011-08-15	12333	11566	Panoramic view looking NE to SE from access road northwest of NWS Landfill
11		C311_4409	2011-08-15	12316	11550	View looking SE at NWS Landfill from access road on northwest side

10 QUALITY ASSURANCE / QUALITY CONTROL

The Quality Assurance/Quality Control (QA/QC) program was implemented to monitor the quality of the analytical results. The main objective of this QA/QC program is to ensure that sampling data and analysis results are complete, precise, exact, representative and comparable. The review consisted in evaluating sample collection/handling methodology, general laboratory comments, field (blind) duplicate samples, and inter-laboratory duplicate samples. Samples collected during the monitoring program were submitted to laboratories accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

All samples were collected following strict Biogenie sampling procedures. Samples were uniquely labelled and control was maintained through use of chain of custody forms. All samples were collected in laboratory-supplied containers and preserved in insulated coolers. Appropriate QA/QC procedures were adhered to at all times.

Blind duplicate samples were submitted to Maxxam for intra-laboratory analysis, while additional duplicate samples were sent to Exova for interlaboratory comparison purposes. Both laboratories are located in Edmonton, Alberta.

The relative percent difference (RPD) is used to evaluate the sample result variability. Average RPD values of less than 100% for soil samples and 30% for groundwater samples are considered an indication of acceptable duplicate sample variability. For groundwater samples, an RPD of greater than 30% may reflect difference in sample turbidity or variance in the sample procedures. Individual RPD values greater than 50% are not considered to reflect acceptable variability. RPD values are not used to evaluate those compounds which are present at concentrations less than five times the method detection limit (MDL).

10.1 SOIL SAMPLES

In the case of soil samples, two blind duplicate samples were submitted for intra- and inter-laboratory comparisons. Review of results indicated relatively minor differences in concentrations within the Maxxam and Exova metals results when duplicates were compared, and considered to be within acceptable limits. It should be noted that many individual parameter concentrations were less than five times the MDL. The soil chemical analysis results and the evaluation of analytical data for the 2011 QA/QC samples are presented in Tables XXXIV and XXXV below.

All TPH and PCB concentrations were below the MDL in the intra- and inter laboratory samples.

Overall, the soil sample results are coherent and within the same range of results for intra- and inter-laboratory samples. In general, the reliability of soil analytical results is considered good.

Table XXXIV: Soil Chemical Analysis Results – QA/QC Samples – Metals – EXOVA

Lab ID		821266-1	821266-2	**Nominal Detection Limit**
Sample ID		**C311-5WA**	**C311-5WB**	
Sampling Date (yyyy-mm-dd)		2011-08-15	2011-08-15	
Parameters	**Unit**			
Mercury	mg/kg	0.01	0.01	**0.01**
Antimony	mg/kg	<0.2	<0.2	**0.2**
Arsenic - Total	mg/kg	3.4	1.6	**0.2**
Barium	mg/kg	17	8	**1**
Beryllium	mg/kg	0.6	0.1	**0.1**
Cadmium	mg/kg	0.03	0.01	**0.01**
Chromium	mg/kg	21.5	4.1	**0.1**
Cobalt	mg/kg	4.8	1.4	**0.1**
Copper	mg/kg	8	6	**1**
Lead	mg/kg	8	2.5	**0.1**
Molybdenum	mg/kg	<1	<1	**1**
Nickel	mg/kg	12.8	2.2	**0.5**
Selenium - Total	mg/kg	0.6	0.3	**0.3**
Silver	mg/kg	0.1	0.1	**0.1**
Thallium - Total	mg/kg	0.13	<0.05	**0.05**
Tin	mg/kg	<1	<1	**1**
Uranium - Total	mg/kg	<0.5	0.6	**0.5**
Vanadium	mg/kg	28.1	8.1	**0.1**
Zinc	mg/kg	13	5	**1**

S/P/CD/CAM-3/2011/T/11-C1-METSOIL-QAQC-Soil.xls

Table XXXV: Soil Chemical Analysis Results – QA/QC Samples – PHCs, BTEX & PCBs – EXOVA

Lab ID	**Sample Name**	**Sampling Date**	**Parameters**								
			Benzene	**Toluene**	**Ethylbenzene**	**Xylenes**	**Total PCBs**	**PHC (F1)**	**PHC (F2)**	**PHC (F3)**	**PHC (F4)**
		yyyy-mm-dd	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
821266-1	C311-5WA	2011-08-22	<0.004	<0.005	<0.010	<0.010	<0.1	<4	<10	<30	<20
821266-2	C311-5WB	2011-08-22	<0.004	0.034	<0.010	<0.010	<0.1	<4	<10	<30	<20
Nominal Detection Limit			**0.004**	**0.005**	**0.010**	**0.010**	**0.1**	**4**	**10**	**30**	**20**

PHC (F1): Petroleum hydrocarbon C_6 to C_{10}, does not include BTEX fractions
PHC (F2): Petroleum hydrocarbon $C_{>10}$ to C_{16}
PHC (F3): Petroleum hydrocarbon $C_{>16}$ to C_{34}
PHC (F4): Petroleum hydrocarbon $C_{>34}$ to C_{50+}

S/P/CD/9229/CAM-3/2011/T/11-C1-BTEX-PHC-soil.xls

10.2 GROUNDWATER SAMPLES

In the case of groundwater samples, one blind duplicate sample was submitted for intra- and inter-laboratory comparisons. The TPH and the PCB results were below the MDL in the intra- and inter laboratory duplicate comparisons. Comparison of intra-laboratory results (BDW1) for total metals indicate RPDs within acceptable limits for most parameters, with the exception of mercury which had a higher RPD of 125%. Results of the inter-laboratory duplicate indicated slightly higher RPDs for most metals, including arsenic (41%), cobalt (42%), copper (46%), lead (43%) and zinc (76%).
Results from the field and travel blanks indicated all concentrations are below the Method Detection Limits.

Overall, the laboratory comparisons for metals in soil are coherent and within the same range of results for intra- and inter-laboratory samples. In general, the reliability of both the soil and groundwater analytical results is considered good. The laboratory comparisons for TPH and PCBs in groundwater are coherent, whereas the inter-laboratory comparison for select total metals was outside the acceptable range, suggesting a possible variance in the sample's turbidity.

Table XXXVI: Groundwater Chemical Analysis Results – QA/QC Samples– Metals – EXOVA

Lab ID		821266-3	**Nominal Detection Limit**
Sample ID		**C311-13W**	
Sampling Date (yyyy-mm-dd)		2011-08-15	
Parameters	**Unit**		
Aluminum	mg/L	47.1	**0.02**
Antimony	mg/L	0.001	**0.0002**
Arsenic - Total	mg/L	0.012	**0.0002**
Barium	mg/L	0.259	**0.001**
Beryllium	mg/L	0.001	**0.0001**
Bismuth	mg/L	<0.001	**0.0005**
Boron	mg/L	0.18	**0.002**
Cadmium	mg/L	0.00020	**0.00001**
Calcium	mg/L	316	**0.2**
Chromium	mg/L	0.0742	**0.0005**
Cobalt	mg/L	0.011	**0.0001**
Copper	mg/L	0.035	**0.001**
Iron	mg/L	30.5	**0.05**
Lead	mg/L	0.017	**0.0001**
Lithium	mg/L	0.17	**0.001**
Magnesium	mg/L	262	**0.1**
Manganese	mg/L	0.523	**0.005**
Mercury	mg/L	<0.0001	**0.0001**
Molybdenum	mg/L	0.01	**0.001**
Nickel	mg/L	0.0349	**0.0005**
Potassium	mg/L	35.0	**0.4**
Selenium - Total	mg/L	<0.0004	**0.0002**
Silicon	mg/L	42.0	**0.05**
Silver	mg/L	0.00034	**0.00001**
Sodium	mg/L	377	**0.4**
Strontium	mg/L	0.639	**0.001**
Sulphur	mg/L	49.2	**0.3**
Thallium - Total	mg/L	0.00055	**0.00005**
Tin	mg/L	<0.002	**0.001**
Titanium	mg/L	2.27	**0.0005**
Uranium - Total	mg/L	0.014	**0.0005**
Vanadium	mg/L	0.0857	**0.0001**
Zinc	mg/L	0.311	**0.001**
Zirconium	mg/L	0.039	**0.001**

Shaded area indicates sample exceeds applicable guidelines
TT: Field duplicate
n/s: Not specified

S/P/CD/9229/CAM-3/Tables/AB/Metals-GW.xls

Table XXXVII: Groundwater Chemical Analysis Results – QA/QC Samples – PHCs, BTEX & PCBs – EXOVA

Lab ID	Sample Name	Sampling Date	Parameters							
			Benzene	Toluene	Ethylbenzene	Xylenes	Total PCBs	PHC (F1)	PHC (F2)	PHC (F3)
		yyyy-mm-dd	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L
021266-3	C311-13W	2011-08-15	<0.001	<0.001	<0.001	<0.001	<0.1	<0.2	<0.1	<0.1
Nominal Detection Limit			**0.001**	**0.001**	**0.001**	**0.001**	**0.1**	**0.2**	**0.1**	**0.1**

PHC (F1): Petroleum hydrocarbon C_6 to C_{10}, does not include BTEX fractions
PHC (F2): Petroleum hydrocarbon $C_{>10}$ to C_{16}
PHC (F3): Petroleum hydrocarbon $C_{>16}$ to C_{34}

S/P/CD/9229/CAM-3/2011/T/11-C1-BTEX-PHC-soil.xls

APPENDIX A

Range of the Report and Limitation of Responsibilities

RANGE OF THE REPORT AND LIMITATION OF RESPONSIBILITIES

A – Recipient and Use

This report ("Report") was prepared by Biogenie, a division of EnGlobe Corp., ("Biogenie") at the request and for the sole benefit of the Client ("Client"), and is intended to be used exclusively by the Client.

B –Site Conditions

Any description of the target site ("Site"), soil and/or groundwater included in the Report is only provided as an indication to the Client, and unless otherwise specifically mentioned in the Report such description shall not at any time and under any circumstances be used for purposes other than to gain a better understanding of the Site and to fulfil the requirements of the mandate assigned to Biogenie by the Client ("Mandate").

All information, including but not limiting the comprehensiveness of the data, charts, descriptions, drawings, tables, analysis results, compilations, and any conclusion and recommendation included in the Report, shall arise from the direct observation of the Site during a specific period, namely the fulfilment of the Mandate, and from the interpretation of such information and data available during the same period.

The content of the Report shall not apply in any way or to any part of the Site or to any parameter, material or analysis excluded from the Mandate.

Biogenie shall not be held responsible for the presence of any substance or material of a different nature, or of a similar nature but with different concentrations, as those indicated in the Report, and this in any part or parts of the Site excluded from the Mandate.

The content of the Report, including its conclusions and recommendations, shall not apply to any period preceding or following the Mandate. The physiochemical conditions of the Site, and the type and degree of contamination identified on the Site, may vary within a given period depending on a number of factors, especially the current activities taking place on the Site and/or on lands adjacent to the Site.

A review of the Report and/or changes in the parameters, conclusions and/or recommendations may prove to be necessary in the event of a change in the Site conditions or the discovery of pertinent information subsequent to the production of the Report.

C - Legislation, Regulations, Guidelines and Policies

The interpretation of the data and observations concerning the Site, as well as the conclusions and recommendations resulting from these, shall take into account the laws, regulations, standards, policies and/or guidelines applicable to the Project and that are in effect at the time of the fulfilment of the Mandate. In the event no current law, regulation, policy, guideline or standard applies to the project, Biogenie shall take into account proven environmental and professional rules and practices when drawing up the Report.

Any change in the legislation, regulations, standards, policies and/or guidelines applicable to the project may result in the need to review the Report and/or modify its parameters, conclusions and/or recommendations.

D – Use of Report

The Report is intended for the exclusive use of the Client and shall only be used for the purpose it was meant for.

The content of the Report and its conclusions and recommendations only apply to the Site and may not, at any time and under any circumstances, apply to any land adjacent to the Site or to any other land located in the vicinity of the Site.

Any reproduction in any form whatsoever and any distribution or use of the Report, in whole or in part, by a person other that the Client, is strictly forbidden without the prior written consent of Biogenie. Biogenie makes no declaration and pledges no responsibility towards any person other than the Client with regard to the content of the Report and the conclusions and recommendations expressed therein.

Biogenie is in no way responsible for any loss, fine or penalty, or for any expense, damage or other prejudice of any type whatsoever, sustained by a person other than the Client as a result of the unauthorized use of the Report.

No provision of the Report shall be construed as or considered to be a legal opinion of Biogenie’s.

APPENDIX B

Field Notes

8°C, OVERCAST,
AUGUST 14, 2011 25-30km/h NW
CRAIG / R03 - ADLAIR
BRANDON, KALEEN, JOE, SUSIE

8⁰⁰ - 9⁰⁰ LOAD. PARK
9-10. FLY TO CAM-1
RE-INSTALL DATALOGGERS
TO ORIGINAL LOCATIONS, STICKERS
ON BOXES DO NOT MATCH LOC
IE Red #1 @ VT-3

10³⁰ - 12⁰⁰ FLY TO COM-3
LUNCH, CHECK IN W/ LINDSAY.

BEACH LANDFILL. 8°C, 25km/h NW
LT. RAIN

439 PAN NW-SW FROM E OF LF.
440 V- NW ALONG NE TOE
V- N ALONG DRAINAGE CH TO
NE OF LF
441 PAN NW-SW from E-TOP
442 MINOR DEPRESSION FEAT. B SAME
V- SE
443 PAN SW-SE, MINOR RUNOFF.
CH. ALONG N-SIDE 10-30cm ↓
FINES WASHING ONLY, NO SIG EROS-

444 PAN SW-NE ACROSS N-SLOPE
FROM ROCK (BLDR) WALL
445 2- DEPRESSIONS AT TOP SLOPE.
V- SW/NE, FEAT B
1x1, 50x60cm 5-10cm ↓
446 CENTER OF DEPR. ON SW TOP
TRACK AROUND IT. 447-451
9m x 10m x 10-30cm ↓
V- SW. FEAT A - SAME
452 PAN SE-N FROM W OF LF.
453 PAN E-NW from S OF LF
454 MINOR EROSION ON S-SLOPE 2 LOC.
1m APART, 2-3m L, 5-10 W, 2-3 ↓
FINES WASHING. VIEW - NE/SW
455 PAN NE-W FROM SE CRNR
456 V- W ALONG RUNOFF 20 ↓
CHANEL.
457 FEAT A ON SE SLOPE, V-S
MINOR SETTLEMNT / ERO - FINES 2.5x10-15x
458 " " 1mx1mx10 ↓, V-SW 3-5 ↓
459 " " II TOP OF SLOPE 3m x 0.4 x 5 ↓
V- NE
560 FEAT C START, MIN EROSION. V-SE
561 - NW

462 FEAT. C. , NE SLOPE TOP-TOE
5m x 0.2-0.3 x 0.05 ↓ ✓ - NW

NO NEW FEATURES

463 HORSHOE DEPRESSION - FEAT. A
✓ - SW

AUGUST 15, 2011
4°C , OVERCAST 30-35 km/h NW.

USAF LANDFILL

MW-12 WP 469 2.6m NNW.
S/up 47-0.08 = 0.39
▽ - dry F/P - ∅
bott. - 1.44m.

C311-12WA 0-10
B 40-50

0 - Med brn sand some blk org 0-15, pg, rootlets, some gravel, damp

3 JARS EACH

MW-13 WP 470. 2.3m N
S/up: 49-18 = 0.31m
▽ 1.10 F/P = ∅
bott. 1.77.

T = 2.6 / 2.6 / 2.5
Cond 5064 / 4267 / 4254 ✓
pH 10.77 / 10.0 / 9.74 / 9.14
Turb. 16.2 / 26.8 / 34.4 TOTAL 1.5L

2 x 1L , 1 x 250pL , 3 x 40mL - EXOVA
3 x 500mL , 1 x 250pL - MAXXAM

LEVEL

13WA 0-10 BRN/GREY SAND
B 40-50 Med gr, tr-org to
0.1, damp, tr-gravel

MW-14 WP 471. 2.4m SE
SLUP 65-17 : 0.48m
∇ 1.45. F/P Ø
bott. 1.66

0-10 - BLK ORG
14A 0-10 (3) 10 BRN/GREY SAND
B 40-50 (3) SOME GRAVEL,
ORG + ROOT TO 0.3
DAMP.

T 1.93
cond 2623
pH 8.37
Turb 43.4 TOTAL = 0.5L
3 x 500, 1 x 250 pl.

MW-15 WP. 472. 2.7m E

Slup 0.6 - 0.07 : 0.53.
∇ 0.63 F/P - Ø
bott. 1.77.

0- BLK ORG.
15WA 0-10 (3) ROOTS, TR SILT + SAND
(BD1) B 40-50 (3) 20- GREY.

T 2.5 / 1.7 / 1.8. ✓
Cond 3160 / 2920 / 2819 ✓
pH 8.21 / 8.08 / 7.93. ✓ TOTAL : 1.8L
Turb. 4.6 / 6.9 / 8.1
6 x 500 mL BDW1.
2 x 250 pl.

15WB. - BD1 + EXOVA + ESG
(3) (3) (2)

VT-1 09100123 WP 473
BAT 11.34, 12.77. ✓.
1 5.7279 / 11.980 6 -1.3689 / 17.658
2 8.0463 / 10.791
3 7.1069 / 11.471
4 4.7274 / 12.941
5 0.1456 / 16.242

LEVEL

DOWNLOAD VT-2, 3, 4. ✓
COMPLETE MEMORY DUMP @ VT-3

USAF LANDFILL

478 PAN SW-SE @ N-SLOPE
479 V- SE "
480 @ MW-12. "
481 V-SE
482 V-SE @ W-SLOPE
483 PAN SE-NE FROM ROAD
485 V-NE @ S-SLOPE, MINOR EROS ON SLOPE.
486 V-NNE " VT-2 ON R.
487 " " VT-2 ON L.
488 " "
489 V-N @ 10m E OF MW-13
490 PAN NE-NW @ SE & LF
491 V-NNW @ S-SLOPE
492 V-NW " 10m SW & MW-14
493 V-WNW @ END SLOPE / VEG.
494 PAN NW-SW FROM E & LF
495 V-SW @ N-SLOPE
496 V-SW, VT-4 IN center, ▼ IN foregnd
497 " ", MW-15 IN foregnd

498 V-SW @ N-SLOPE, EDGE OF GRAVEL
499 V-SE ALONG TOE
500 V-E @ SMALL PONDED / STAINED AREA (IRON?) @ TOE 1x1m. VEG ▼
501 MINOR EROS / DEP OF FINES ALONG TOE V-SE
502 PAN SW-E ACROSS TOP FROM ROAD
503 PAN S-NE " "
504 START OF CRACKS - SE DIR, 4-5m UP FROM TOE (⊥ SLOPE), V-SE
505 CLOSE UP 4m SE & START UP TO 3 CRACKS 0.3-1cm W., 0.6-0.8m APART. ~35-40m LONG extending AROUND CRNR
507 V-NW, END
506 ~1.6m NW & 507, 3 cracks, 30-50cm APART
508 START OF SINGLE CRACK 10m SE & VT-2 V-ESE, 8m UP FROM TOE
509 CLOSE UP 1-5m W., START & 2ND CRACK 0.4m APART,
510 END, V-WNW.
511 START OF SINGLE CRACK, 10m UP 1-3m W, V-ESE
512 CLOSE UP

513 3 CRACKS UP TO 15mm W
5-7 up, CLOSE UP 1-1.5 m APART
⊥ SLOPE.

514 END, V- WNW.

515 M.N. EROS. WASHOUT. F NES. START
3 m below top slope -> toe, V-SSW
SAME.

516 START OF SINGLE CRACK, P. INFILL
↑ ⊥ SLOPE. V ESE, 5m UP.
BLW CLOSE UP 2-3 mm W.
517 END, V- WNW.

518 FEAT. A - M.N. DEPRESSION - SAME
NEAR TOE (2 m) 0.4 x 1 m x 5-7 ↓
V- W

519 START OF SINGLE CRACK, 5 m UP.
EXT. NNE, CLOSE UP + V. NE, 3-5mm
2-3 CONT. OFFSET CRACKS. TO 520
V- SSW

521 PAN N-W from S END OF LF
V- E/W & EROSION TOP - TOE 10-20 W.
25 mL, 5-10 ↓ MEANDERS → 522

523 START OF CRACK. 10 m UP, V-NE + CLOSE UP TO
TO 7m, WRAPS AROUND END,
3-1 cm W

524 END, V-S. 1-2 /// - 7M UP.

525 CLOSE UP.

526 SMALL DEPRESSION, V- NNW
CRACK JUST ABOVE 50 x 50 x 5 ↓

527 subtle depression in eros. near top.
3 m below crest, 4-5 m W, x 3 m x
up to 15 cm ↓ V-SSE

528 MINOR EROSION TOP-TOE 10-15 W
x 5 cm ↓ V-E

529 P. EXP. METAL, DRUM, CRUSHED.
CLOSE UP, V-NW (VT-4 IN BK)

530 SUBTLE DEPRESSION ON SURFACE,
1.5 x 3 m x 10-15 ↓ V+ E/N.

531 1 x 6 m SUBTLE DEPRESSION 10 ↓
V- NE / NW.

532 V. SE

534 PAN SW-SE FROM RD @ BM-6

NWS LANDFILL

533 PAN SE-NE FROM RD

535 - V. NE, 536, 537, 538

539 - V- N

540 V- WNW

541 V-SW, 542, 543

544 PAN SW-SE FROM RD

545 V- SE &

TIER II

MW-4 WP 546 2.4m NW
Slug 0.67 - 11 = 0.56 m
Σ dry F/P = Ø
bott. 2.26

C111-4 WA 0-10 (3) LT BRN SAND,
B 40-50 (3) W/GRAVEL & CBLS
dry

Bent heave base, esg loose

MW-7. WP 547 2.5m SE
Slug 65-15 = 0.5m F/P = Ø
Σ 1.445
bott. 2.05

7 WA 0-10 (3) BROWN SAND,
B 40-50 (3) WITH GRAVEL, TR
SILT, DAMP.
- SOME SILT BELOW
0.4m

T : 3.5 | 2.3 | 2.1
Cond - 4023 | 3934 | 3833
pH 7.42 | 7.38 | 7.37
Turb 487 | 792 | LO L

TOTAL
0.9 L

3 x 500
1 x 250 PL -

2.5m NNW
MW-6 WP 548
Slug 082-23 = 0.59m
Σ dry F/P = Ø
bott. 1.31

BENT HEAVE @
BASE, CSG LOOSE

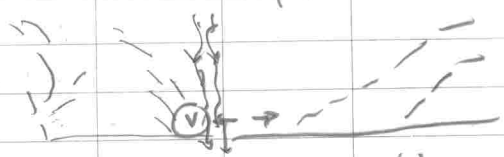
0-5 BLK ORG
6 WA 0-10 5-BRN/GREY
B 40-50 SILT W/ F G
SAND, DAMP

MW-5 WP 550 2.2m W
Slug = 0.69, well pipe heaved
up, loose (wobbly), cover pushed up.
Σ dry F/P = Ø
bott. 1.75

BD2 5 WA 0-10 (11) LT BRN SILT,
B 40-50 (3) TR F G SAND
DAMP, TR BLK
ORG, ROOTLET

LEVEL

549 TOE OF EROSION - 2m W, TOP-TOE, 5-7cm ↓, 2 channels, V-N
ALSO CRACKING FROM SLUMP AT BASE RADIAL UP TO 3m TO BASE, 5-20mm W- 20cm deep



min. slumping along bottom 1-2m of toe resulting in radial cracking.

551 PAN E-N from SW ⊙/LF
552 V-N @ S-SLOPE
553 " " MW-↓ ON RIGHT
554 " " VT-7 IN BACKGND
555 PAN N-W FROM SE ⊙/LF
556 V-N/W ALONG TOE (SE CRNR)
NOTE 2 AREAS OF SETTLEMENT ALONG S TOE.
557 V-W AT E-SLOPE, 558, 559 "
560 NE CRNR V-W, S.
NO WP DEPRESSION @ TOE FEAT A, SAME V-N 80x40x10↓
561 PAN - W-S from NE ⊙ LF

↑PLAQUE

562 V-S @ N-SLOPE, 563, 564 "
565 PAN S-E from NW ⊙/LF
566 V-S/E ALONG TOE FROM NW CRNR
567 V-E @ W-SLOPE, 568, 569 "
570 TOE OF EROS. TOP TO WITH ~1.5m ⊙/TOE 15-20W, 5-7↓, V-E.
571 START OF N/S CRACK @ CRNR 5m UP V-N, 3-15mm W., 8m UP SPLITS AROUND CRNR TO E.
572 CLOSE UP ½ V-N, 2 cracks 40-50 APART ALSO // CRACK 2m downslope / 3m UP from toe
573 END, V-S
574 depression on slope 2x0.5. Below crack (1m) V-N
575 TOP - V-W downerosion W @ VT-8
576 2m below VT-8 on slope, depression V-S - SAME FEAT. B 0.7x0.5x10↓ V-E @ VT-8.
DAN E-N from SW CRNR
577 V-S @ EROSION 0.3W, top-toe 5cm↓
578 SMALL DEPR. 5m below VT-8 on slope 0.5x0.3x10↓

579 V-E e depr. below crest,
0.8x0.4x10↓ SAME

580 V-S e 2 erosion paths up from
MW-6 (BKGND)

581 V-W e VT-7, ALSO LIN DEPR
ON SLOPE JUST E of VT-7 ON CREST
1m x 0.4 x 10↓, V-SE

582 PAN. N-W from SE CRNR

583 depression on SE slope.
V-SE 0.6x0.3x15↓

584 depression on slope SAME, V-SE
QUAD TRACK TROUGH - 5-10↓

585 PAN. W-S, NE CRNR
V-W e VT-5.

586 MIN. DEPR. ON NE SLOPE, V-SW.
0.7x0.4x5-7↓ SAME

587 depr. on surface, V-W. 50x3x5-7↓

588 PAN - S-E FROM NW CRNR
V-E e VT-6.

589 MIN DEPR. // to CREST 2x0.5x2.5↓
V-N., ALSO MIN EROS. 3m L x
0.2 w x 2-3↓. V-W. FROM

590 SW CORNER, CRACK EXT 3m
UP SLOPE JUST E of CRNR V-NE
AND TURNS E @ ~9-10 UP
from toe.

591 V-E @ 3 cracks bw 9 & 10 m up.
UP TO 1-3 cm W. Close up

592 numerous cracks @ 3, 4, 5, 6, 7
m up, up to 5 cm, V-E
some over 50 cm deep. -Ph

593 depression toe of slope, Sig cracks
above., E + W. 5m L x 2.5 W ~ 20↓

up to 3x50cm V-W, E, Cracks ext' up ~10-12 m
upslope to 594 2-3 m W.
worst e 3-7 m up from toe.

594 V-W. + close up. 8+ cracks

595 V-W Cracks dipping towards toe
slope ~ 2-3 m up. 1-2 cracks up to
2 cm W. 20-40 cm deep

596 V-E 1m UP from toe. 20cm deep

597 V-E ALONG TOE, MUTE DEPRESSIONS

August 16, 2011 — 8°C, Overcast 5-10km/h S.

STATION LF — LOBE A

598 PAN S-W AT LOBES A + B.
599 V-SE @ LOBE A
600 V-SSE ALONG E-TOE
601 " "
602 V-N ALONG E TOE, MIN. IRON COLORED STAINING, NO POND/SEEPAGE, SAME AS 2010
603 PAN NE-W ACROSS TOP
604 " NE-NW FROM S OF LF
NO SETTLEMENT / EROSION / DEBRIS.

LOBE B

605 PAN E-N. FROM SW OF LOBE
606 PAN E-NW FROM S OF LOBE
607 // cracks on toe 50cm apart, 1-3m w. V-E EXT E ALONG TOE THEN TURN NE UPSLOPE TO CREST @608 (SINGLE) FOLLOW TRACK 609 → 610 END V-W.
611 V-W ALONG TOE - NO PONDING
612 MIN EROSION, ON S-SLOPE 5mL 20-60W x 5↓, WASHING FINES V-NNW / SSE

613 D. EXP METAL DEBRIS 15cm x 8cm x ? EXT INTO SLOPE, V-N.
614 MIN. EROSION TOP-TOE + SETTLEMENT, V-S/N. 60x30x10↓; 1.5x0.4x10↓ 2 Spots — FINES 11m x 30 x 5↓ MID SLOPE
615 EROSION ON S SLOPE .20-2m W, 10m L, 5↓ FINES WASHED V-N/S
616 PAN NE-NW @ S. SLOPE
617 " " FROM SE @ LOBE B
618 V-W/NE ALONG TOE, MIN EROS ALONG SE TOE 20m L, 0.5 W x 1-3cm↓
619 V-NW ALONG N-TOE
620 PAN NW-SW FROM SE CRNR
621 MIN SETTLEMENT, 70x70x10↓ V-W
622 SETTLEMENT JUST S OF CREST 1.5-2m x 1m x 10-15↓ V-NW/SE deeper than 2010
1m apart
623 SETTLEMENT 1.5x0.4W x 10↓, V-SE
624 " " 2m x 0.4 x 10↓ V-SE
625 V. SE ALONG N-TOE, V-W ALONG DRAIN CH (START)
626 V-SW ALONG DRAIN CH - SAME. ALSO - WOOD 2x4 x 0.5 exp from lobe
627 PAN SW-SE ACROSS TOP

628 V - SE AT TOE OF 1ST BREAK

629 V-SW ALONG MIN EROS. ON SURFACE .20 W x 2-3↓ x24L - V-NE 630

631 V - SE ALONG TOE OF 2ND BREAK

632 START OF CRACK ON LOWER BENCH, V-S, 3-5mm W W/ WASH. 12 OUT TO 5Cm EXT. TO TOE 633

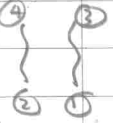
2ND CRACK TO E@ 634 V-NE

3m W., V-S. - NO WASHOUT

636 PAN SE-N @ 2ND BREAK SLOPE

637 EROS. ON 2ND SLOPE, TOP - TOE. C3-1m W, V-NE

638 V-SW, ALSO SIMILAR EROS 5m W. ON SLOPE (PHOTOS)



639 EROS. ON 2ND SLOPE, V-NE/SW 0.3 W, 13m L, 2-3↓

LOBE C

640 PAN SW-SE ACROSS TOP - NW CRNR

641 V-S ALONG W. TOE, MIN. EROS - SAME

642 V-N " "

643 V - NE/SE FROM SW CRNR

644 CRACKS. (3), V-SE. ON SLOPE 2-5mm W. EXT. TO 645 IN FINES EXP. V-NW

646 V - NW/NE FROM SE CRNR PAN NE-W. ACROSS TOP.

647 PAN NW-SW from E of LOBE

648 V - SSW/NW ALONG TOE

649 MIN SETTLEMENT 0.3 x 0.3 x 15↓ V-SW

650 " " 0.25 x 0.6 x 5-7↓ V-SW

NHWLF 10:00 P. CLOUDY, 11°C CALM

651 V-NW ALONG NE TOE FROM RD

652 V - SW/NW " "

653 V-SW @ NE SLOPE 654, 655.

655 V - SW/SE ALONG TOE N. CRNR

656 PAN SW-E FROM NW OF LF

657 V - SE - @ NW SLOPE 658, 659

660 V - NW/SE ALONG TOE SW CRNR

661 V - NE @ SW SLOPE, 662, 663.

664 V - NW/NE ALONG TOE, SE CRNR

665 PAN - NE - W ACROSS TOP.

666 SETTLEMENT V - NW/SE 1.5 x 2 x 0.20↓

667 PAN SE-N ACROSS
668 SMALL DEPRESSION 25x15x5↓
V-NE
669 ELONG DEPRESSION @ CREST V-SE
3m x 0.8 x 5-10↓
668 ALSO V-SE ACROSS TOP
669 ALSO V-SE " "
67[illegible] MIN. EROS (BARELY NOTABLE) TOP-TOE, SAME, V-NW/SW
670 MIN. DEPR. 30x20x 5-7↓
1m below top, V-SW
672/3 TOE, CRACK 12cm L, 1.5cm W.
ISOLATED.
674 PAN SW-NE ACROSS TOP
675 EXP DEBRIS, METAL BED RAIL
V-SE
676 V-NW ACROSS, 677, 678-✓
679 MIN. DEPR ON SE SLOPE 3m UP
FROM TOE, 40x15x10↓ V-SW

NORTHEAST LANDFILL-

680
PAN E-NW FROM ATOP GRAVEL PILE

LOBE A
681 V-ANE/SW ALONG TOE
682 DEPR ON S SLOPE 5m x 2m x 20↓-30
V-SSW
683 V-SSW 12x1x5↓ depression
up from crest.
684 STAIN, DK., OILY ODOUR? 1x0.7x?
V-S
685 V-NW/SSW ALONG TOE
686 DEPRESSION, 70x60x10 V-SE/SSW
ALSO MINEROS ON SLOPE 1x10x5↓
687 V-ESE/SW ALONG TOE
V-NE @ SETTLEMENT ON NW CRNR.
1x2x15↓
688,-694 PTS OF MIN. EROSION ALONG
3779 W. SLOPE 0.1-0.6W - TOP. TOE, 1-3m
3-10↓, V-ESE @ 696/97/94

LOBE B.
780 - PAN NNE-W. ACROSS SW CRNR
781 " NE-W " "

LEVEL

782 PAN - SE-N FROM NW & LOBE

783 FEAT.B LIN. DEPRESSION
4m x 0.4 x 5↓ V-SSW.

784 3 PTS OF EROSION ON W SLOPE
TOP-TOE (4m) 10-70W, 3-10↓
V- E

785 START OF CRACK @ TOE 2-5mm W.
JUST S OF EROSION // SLOPE
V-E EXT. TO CREST + S. 2 CRACKS
50cm APART, 1 P. INFILLED UP TO
TO 787 CRNR 30mm W. 786 - V-S, CLOSE UP

789 2. MIN EROS 20-30 W, TOP-TOE
(5m) 5↓ V- SE/NW

790 PAN SW-E FROM NW OF LOBE
V- NE @ LOBE C

791 V-SSE ALONG N TOE MIN EROS.
SAME, V-S @ SLOPE MIN EROS
-SAME

792 V- WNW ALONG N SLOPE TOE

793 4x4m dist. @ side slope - heavy
equip, recent. V- W/N
poss dug out + replaced w/ uncomp.
mat'l.

100 14°C Sunny, sl-breezy
LOBE E

001 PAN E-N FROM SW CRNR

002 V- NS. @ SETTLEMENT SmLy
20m x 10↓

003 DEPRESSION NEAR CREST 0.5x0.7x
5-7↓ V- S

004 " " ON SW CRNR 2x1x10-15
V-S

005 CENTER OF LARGE DEPRESSION
FEAT. F. - SAME V-S 50-80↓
BOWL SHAPE

006 V-W/N @ SE CRNR

007 PAN N-W NEAR TB N°14

008 PAN NNW-SW

009 DEPRESSION 2m E-W, 0.3x 10-15↓
V-SW

010 V- N/SE ALONG TOE

011 MIN. EROSION V-E/W. 30-50 W
TOP-TOE (6m) 2-3↓

012 " " 5m N. V-E/W
BARELY NOTICABLE

013 V- S ALONG E TOE

014 V- SE/WSW ALONG TOE

015 PAN SW-NE FROM NW CRNR

016 3 AREAS OF LOC. DEPRESSIONS
0.5-1m x 0.3 x 5-10↓ V-SE
017 DEPRESSION ON W SLOPE 1x0.5x0.25↓
V-S

LOBE D

018 V-SSW ALONG E TOE, MIN DEPR.
IN FOREGND 0.7x0.4x5↓
V-N. 3m x 0.6 x 5↓
019 V- SSW ALONG TOE, PAN NNE-SW
ACROSS TOP.
020 V- NNE/W from SE CRNR
021 V-N. ALONG W TOE
022 PAN NW-SW @ LOBE C.
TR VEG ON SURFACE.
023 2 SMALL DEPR. V-S. SAME 10↓
024 PAN N-W @ LOBE G
025 + 026 STAINS - SAME
027 PAN SW-SE FROM N ℄ END

LOBE F

028 V-SE/NNW
029 V- W/N @ DIST. AREA, LOADER DUG
INTO SIDE SLOPE. 25↓ x 3m W.

030 dist area near NW CRNR, 5x4m
on slope, loader tracks top grd removed
V-E/S ALSO SW ALONG S SLOPE
PAN S-NE from NW top CRNR
031 PAN N-SW from SE CRNR
032 V-NW/S. ALONG TOE
033 V-NE @ FORMER PONDED AREA
034 PAN SW-SE FROM N OF LOBE

LOBE G

035 PAN NE-SW.
036 SMALL DEPRESSION 40x40x5↓ SAME
V-W.
037 V- W/E @ MIN. EROSION END
0.2-1.0 x 2-3↓ 20m L. 038
039 SMALL STAINS - SAME V-SW.
040 V- SW/NNE ALONG TOE
041 V-S FROM NE CRNR, 2-3
DISCONT. CRACKS AT 80° slope in SSW
DIRECTION 5-20mm W. → 042 END
V-N
043 SINGLE N/S CRACK 2-8mm W.
V-N, ALSO V-SW AT RUTS ON cover
V-S ↳ 044 END.
CLOSE UP near merge

045 V-S @ MIN. EROSION ON N-SLOPE
TOP TOE (3m) 20-30 W, 2-3↓
046 V-W ALONG TOE, PAN W-SE

LOBE H

047 V-NNE ALONG E SLOPE/TOE
048 V-S ALONG E TOE.
V-S AT MIN DEPRESSIONS - SAME
V-W AT " " SAME
2- 1x0.2x5↓
↳ V-E
049 V-E
050 V-S @ N. SLOPE
051 V-S. ALONG W TOE
NO SIG EROSION NOTED ON W SIDE
052 V-NE

LOBE G

052 V-SE
053 V-NW AT FORMER DR. CHANNEL
054 CRACK UP SLOPE FROM TOE + ON
TUNDRA - TO W (3m), V-SE
5m UPSLOPE, V-NW @ FORMER
DR. CHANNEL, V-N/S.

055 2-3. // cracks ext. from toe
in S direction @ 45° upslope. to
crest, V-S. 30-50 APART
0.5-3 cm W. larger p. infilled
@ 5m up from toe.
056 END, V-N ALONG TOP SLOPE
057 V-W
058 LARGE CRACK. UP TO 5cm W
V-NW 4m L., 15cm deep
V-SE @ MIN. STAINING + PONDING @ TOE
1x0.5 W
059 PAN S-E. FORM 6m thick single
060 3 LARGE CRACKS ON S SLOPE NEAR
PONDED WATER V-E 5-10cm W.
EXTENDS ALONG TOP OF SLOPE
061 V-N @ CRACK AREA, MIN POND ALONG
TOE
062 END OF CRACK - DIPS TO TOE AGAIN
V-W., NOTE SETTLEMENT ALONG
SLOPE.

LOBE C

063 V- W/S ALONG TOE

065 SINGLE CRACK W/S. 1M UP ON TOP TO TOE. 2-3mm W V-W/S

064 PAN SNE FROM NW CRNR

066 CRACK "V" 4-8mm W., V-W AT TOP SLOPE

067 P. INFILLED CRACKS EXT N-S + SW/NE ON NW CORNER, V-S

V-SW & MIN STAINED (FORMER) POND AREA AT TOE 0.5 x 3m L FEAT @

068 V-SE INFILLED CRACK + 2 POTHOLES SAME, NEW 2mm W crack. 30cm above potholes, ext. in SE dir across top 069 V-SE

@ end V-NW. 2-3 cracks. up to 1cm W.

071 V-SE @ // p.infill cracks 1-2m L 2-4cm W.

072 V-NNE @ MIN EROS 10W x5↓ top-toe - SAME., NO pond/toe

073 2 - min depressions 45 x 0.4 x 5↓ V-W/N.

074 2 POTHOLES ON E SLOPE, 20x30x10↓ V-N

EXOVA

COC's CAM -1 89706
-3 89707

LEFT ON SITE FOR 2012

6 COOLERS, 4 Boxes Soil JARS
43 x 500 mL AMBER, 11-1L AMBER, 18-250 pl

APPENDIX C

Maxxam and Exova QA/QC Reports and Certificates of Analysis

CONFIRMATION-RECEIPT OF SAMPLES FOR ANALYSIS

Maxxam Job # B176925

Client Project #: DLCU LANDFILL MONITORING 25 Samples
Site Location: CAM-3 SHEPHERD BAY

Samples Received 2011/08/18
Client Confirmation 2011/08/19
Expected Report Delivery 2011/08/25 18:00

Report will be sent to:
ANDREW PASSALIS
SILA REMEDIATION
QUEBEC
GIP 2T7
Ph 204-791-4938
Fax 418-781-0186
apassalis@mts.net

Invoice will be sent to:
JEAN-PIERRE PELLETIER
SILA REMEDIATION
QUEBEC
GIP 2T7
Ph 4186534422-5431
Fax 418-653-3583
jppelletier@biogenie-env.com

Copy of Report will be sent to:
JEAN-PIERRE PELLETIER

We have received the following samples:

C311-4WA Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4432

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sample Shipping & Handling
Sub Sample for Dry Grind
Sub-sample for metals

C311-4WB Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4575

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-5WA Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4580

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils

Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-5WB Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4581
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-6WA Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4582
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-6WB Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4583
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-7WA Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4584
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls

Sub Sample for Dry Grind
Sub-sample for metals

C311-7WB Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4585
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-12WA Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4586
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-12WB Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4587
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-13WA Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4588
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-13WB Sampled 2011/08/15 Matrix: SOIL

Maxxam #: BH4597

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-14WA Sampled 2011/08/15 Matrix: SOIL

Maxxam #: BH4598

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-14WB Sampled 2011/08/15 Matrix: SOIL

Maxxam #: BH4599

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-15WA Sampled 2011/08/15 Matrix: SOIL

Maxxam #: BH4600

*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-15WB Sampled 2011/08/15 Matrix: SOIL

Maxxam #: BH4601

*AT1 BTEX and F1-F4 in Soil

Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-BD1 Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4603
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-BD2 Sampled 2011/08/15 Matrix: SOIL
Maxxam #: BH4604
*AT1 BTEX and F1-F4 in Soil
Acid Digestion for Metals - Soils
Drying and Grinding
*Elements by ICPMS - Soils
Environmental Sample Disposal Fee
PCB Extraction
Polychlorinated Biphenyls
Sub Sample for Dry Grind
Sub-sample for metals

C311-7W Sampled 2011/08/15 Matrix: WATER
Maxxam #: BH4658
*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

C311-13W Sampled 2011/08/15 Matrix: WATER
Maxxam #: BH4855
*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

C311-14W Sampled 2011/08/15 Matrix: WATER

Maxxam #: BH4856

*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

C311-15W Sampled 2011/08/15 Matrix: WATER

Maxxam #: BH4857

*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

C311-BDW1 Sampled 2011/08/15 Matrix: WATER

Maxxam #: BH4858

*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

C311-FB Sampled 2011/08/15 Matrix: WATER

Maxxam #: BH4859

*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

C311-TB Sampled 2011/08/15 Matrix: WATER

Maxxam #: BH4860

*Regulated Metals (CCME/AT1) - Total
Acid Digestion for Total Metals - Waters
Environmental Sample Disposal Fee
Hydrocarbon by IR (Mineral oil & grease)
Mercury - Low Level (Total)
Polychlorinated Biphenyls

Comments:

- Unless special storage arrangements are made, all samples will be discarded 60 days after receipt of samples.
- Non-regular samples are flagged as (C) Composite by lab, (H) Hold, or (L) Leachate.
- If there are any problems with the submitted samples, a Sample Integrity Form (SIF) detailing conditions will be included in this confirmation.
- For revisions please contact your Maxxam Project Management team at Ph (403) 291-3077 or Fax (403) 291-9468.

Your Project Manager is: Ioana Stoica

Maxxam Job # B176925 PARAMETERS FOR ANALYSIS REQUESTED

The values listed below are RDL's and not results. Report Detection Limit (RDL) may be elevated if there are matrix interferences or limited sample amounts.

Maxxam # BH4432, Sample IDN: **C311-4WA**
Maxxam # BH4575, Sample IDN: **C311-4WB**
Maxxam # BH4580, Sample IDN: **C311-5WA**
Maxxam # BH4581, Sample IDN: **C311-5WB**
Maxxam # BH4582, Sample IDN: **C311-6WA**
Maxxam # BH4583, Sample IDN: **C311-6WB**
Maxxam # BH4584, Sample IDN: **C311-7WA**
Maxxam # BH4585, Sample IDN: **C311-7WB**
Maxxam # BH4586, Sample IDN: **C311-12WA**
Maxxam # BH4587, Sample IDN: **C311-12WB**
Maxxam # BH4588, Sample IDN: **C311-13WA**
Maxxam # BH4597, Sample IDN: **C311-13WB**
Maxxam # BH4598, Sample IDN: **C311-14WA**
Maxxam # BH4599, Sample IDN: **C311-14WB**
Maxxam # BH4600, Sample IDN: **C311-15WA**
Maxxam # BH4601, Sample IDN: **C311-15WB**
Maxxam # BH4603, Sample IDN: **C311-BD1**
Maxxam # BH4604, Sample IDN: **C311-BD2**

ELEMENTS BY ICPMS - SOILS			
Chromium (Cr)	1 mg/kg	Cobalt (Co)	1 mg/kg
Copper (Cu)	5 mg/kg	+Mercury (Hg)	0.05 mg/kg
Lead (Pb)	1 mg/kg	Nickel (Ni)	1 mg/kg
Arsenic (As)	1 mg/kg	Zinc (Zn)	10 mg/kg
Cadmium (Cd)	0.1 mg/kg		
POLYCHLORINATED BIPHENYLS			
Aroclor 1016	0.01 mg/kg	Aroclor 1221	0.01 mg/kg
Aroclor 1232	0.01 mg/kg	Aroclor 1242	0.01 mg/kg
Aroclor 1248	0.01 mg/kg	Aroclor 1254	0.01 mg/kg
Aroclor 1260	0.01 mg/kg	Aroclor 1262	0.01 mg/kg
Aroclor 1268	0.01 mg/kg	Total Aroclors	0.01 mg/kg
AT1 BTEX AND F1-F4 IN SOIL			
F2 (C10-C16 Hydrocarbons)	10 mg/kg	F3 (C16-C34 Hydrocarbons)	10 mg/kg
Reached Baseline at C50		F1 (C6-C10) - BTEX	12 mg/kg
(C6-C10)	12 mg/kg	Benzene	0.005 mg/kg
m & p-Xylene	0.04 mg/kg	Xylenes (Total)	0.04 mg/kg
Toluene	0.02 mg/kg	Ethylbenzene	0.01 mg/kg
o-Xylene	0.02 mg/kg	Moisture	0.3 %

Maxxam # BH4658, Sample IDN: **C311-7W**
Maxxam # BH4855, Sample IDN: **C311-13W**
Maxxam # BH4856, Sample IDN: **C311-14W**
Maxxam # BH4857, Sample IDN: **C311-15W**
Maxxam # BH4858, Sample IDN: **C311-BDW1**
Maxxam # BH4859, Sample IDN: **C311-FB**
Maxxam # BH4860, Sample IDN: **C311-TB**

MERCURY - LOW LEVEL (TOTAL)	
Mercury (Hg)	0.002 ug/L

POLYCHLORINATED BIPHENYLS			
Aroclor 1016		Aroclor 1221	
Aroclor 1232		Aroclor 1242	
Aroclor 1248		Aroclor 1254	
Aroclor 1260		Aroclor 1262	
Aroclor 1268		Total Aroclors	
HYDROCARBON BY IR (MINERAL OIL & GREASE)			
Total Petroleum Hydrocarbon	2 mg/L		
REGULATED METALS (CCME/AT1) - TOTAL			
Chromium (Cr)	0.001 mg/L	Cobalt (Co)	0.0003 mg/L
Copper (Cu)	0.0002 mg/L	Lead (Pb)	0.0002 mg/L
Nickel (Ni)	0.0005 mg/L	Arsenic (As)	0.0002 mg/L
Zinc (Zn)	0.003 mg/L	Cadmium (Cd)	0.005 ug/L
+Cadmium (Cd)			

Sample Integrity Form

Invoice To:
SILA REMEDIATION
4495 BL. WILFRED-HAMEL BUR 100
ATTN: JEAN-PIERRE PELLETIER
QUEBEC, PQ
CANADA GIP 2T7
Client Contact:
ANDREW PASSALIS

Maxxam Job #:	B176925
Date Received:	2011/08/18
Your Project #:	DLCU LANDFILL MONITORING
Maxxam Project Manager:	Ioana Stoica

- [x] Temperature > 10 C
- [x] Labelling issue (missing/incorrect)
- [x] Incorrect preservation or headspace present

Report Comments

2. Average temperature upon receipt >10°C

11. COC 2of3, line 2: C311-15WB on the COC, sample container states C300-14WB, as per job pattern.

15. Headspace present in samples C311-4WA (3x125J), C311-4WB (2x125J), C311-5WB (1x125J), C311-12WA (3X125J), C311-12WB (3X125J), C311-13WA (2X125J), C311-13WB (2X125J), C311-14WA (3X125J), C311-14WB (3X125J), C311-15WA (2X125J), C311-15WB (4X125J), C311-BD1 (3X125J)

Received Date: 2011/08/18 **(Time):** 12:20 **By:** JB0

Inspected Date: 2011/08/19 **(Time):** 10:46 **By:** SP0

SIF Created Date: 2011/08/19 **(Time):** 12:45 **By:** JBO

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Invoice To: Require Report? Yes [X] No [ ]

	Invoice To	Report To
Company Name:	SILA REMEDIATIONS (Client# 4781)	
Contact Name:	jp. Pelletier	
Address:		
	Prov: PC:	Prov: PC:
Contact #s:	Ph: Fax:	Ph: Fax:

PO# / AFE#:	
Quotation #:	A90192
Project #:	DLCU LANDFILL MONITORING PROJECT
Proj. Name:	
Location:	CAM-3
Sampler's Initials:	

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use

- [ ] AT1
- [ ] CCME
- [ ] OTHER

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):

apassalis@mts.net

jppelletier@biogenie-env.com

SERVICE REQUESTED:

- [ ] RUSH (Please ensure you contact the lab to reserve)
  Date Required:
- [X] REGULAR Turnaround (5 to 7 Days)

#	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	SOILS: BTEX F1-F4	Sieve (75 micron)	Salinity 4	Regulated Metals (CCME / AT1)1	Assessment ICP Metals2	☐ Paint Filter ☐ Flashpoint ☐ pH (1:1)	TCLP ☐ BTEX ☐ Metals			WATERS: TPHIR	☐ Ammonia ☐ TKN ☐ COD	☐ TOC ☐ DOC	REGULATED METALS (CCME / AT1)3 Total ☐ Preserved ☒ Not Preserved (See List)	Dissolved ☐ Preserved ☐ Not Preserved ☐ Filtered ☐ Not Filtered	Mercury ☐ Total ☐ Dissolved	PCB		OTHER TEST(S)								*HOLD for 60 Days	# of Containers Submitted
1	C311- FB	W	15/8/11										X			X			X											4
2	C311 - TB	"											X			X			X											4
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

SOILS (footnotes defined on back) — WATERS (footnotes defined on back)

ARRIVED AT DEPOT: AUG 18 2011

TEMP: 7/6/7/ 1/2/2 /2/6

All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.

Maxxam Job #: B176925

Relinquished By: Sign and Print: A. PASSALIS Date/Time: 16/8/11

JARS USED & NOT SUBMITTED

Received By: RECEIVED AUG 19 2011 — 0806

CUSTODY SEAL YES / NO

Temperature			Ice

COMMENTS/SPECIAL INSTRUCTIONS:

TOTAL METALS - Cu, Ni, Co, Cr, Cd, Pb, Zn, As, Hg.

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Invoice To:	Require Report? Yes [X] No [ ]	Report To:		PO# / AFE#:	
Company Name:	SILA REMEDIATIONS (Client# 4781)			Quotation #:	A90192
Contact Name:	J.P. Pelletier			Project #:	DLCU LANDFILL MONITORING PROJECT
Address:				Proj. Name:	
	Prov: PC:	Prov:	PC:	Location:	CAM-3
Contact #s:	Ph: 418-653-4422 Fax:	Ph:	Fax:	Sampler's Initials:	

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use

- [ ] AT1 _____
- [ ] CCME _____
- [ ] OTHER _____

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):

apassalis@emts.net

jppelletier@biogenie-env.com.

SERVICE REQUESTED:

- [ ] **RUSH** (Please ensure you contact the lab to reserve)

  Date Required: _____
- [X] REGULAR Turnaround (5 to 7 Days)

				SOILS (footnotes defined on back)										WATERS (footnotes defined on back)								OTHER TEST(S)							*HOLD for 60 Days	# of Containers Submitted
	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	BTEX/F1-F3	Sieve (75 micron)	Salinity 4	Regulated Metals (CCME / AT1)1	Assessment ICP Metals2	□ Paint Filter □ Flashpoint □ pH (1:1)	TCLP □ BTEX □ Metals	PCBs	Metals - see List	TPHHR	□ Ammonia □ TKN □ COD	□ TOC □ DOC	Total □ Preserved ☒ Not Preserved	Dissolved □ Preserved □ Not Preserved □ Filtered □ Not Filtered	Mercury □ Total □ Dissolved	PCB										
																REGULATED METALS (CCME / AT1)3														
1	C311-14WA	S	15/8/11	X							X	X				See List			X										3
2	C311-15WB			X							X	X							X										3
3	C311-15WA			X							X	X																	3
4	C311-15WB			X							X	X																	3
5	C311-BD1			X							X	X																	3
6	C311-BD2			X							X	X																	3
7	C311-7W	W	15/8/11										X			X			X										4
8	C311-13W												X			X			X										4
9	C311-14W												X			X			X										4
10	C311-15W												X			X			X										4
11	C311-BDW1												X			X			X										4
12																														

ARRIVED AT DEPOT:

AUG 18 2011

TEMP: 9/8/9/

Maxxam Job #: B176925

** All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.*

Relinquished By: _____ **Date/Time:** 16/8/11

Sign and Print: A. PASSALIS

COMMENTS/SPECIAL INSTRUCTIONS:

TOTAL METALS - Cu, Ni, Co, Cr, Cd, Pb, Zn, As, Hg

# JARS USED & NOT SUBMITTED	Received By	Temperature	Ice
	RECEIVED AUG 19 2011		
	CUSTODY SEAL YES / NO		

JED 080C

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Invoice To: Require Report? Yes [X] No [ ]

Company Name: SILA REMEDIATIONS (Client# 4781)
Contact Name: J.P. PELLETIER
Address: 4495 WILFRID-HAMEL BLVD, SUITE 200
Prov: QUEBEC, QUEBEC PC:
Contact #s: Ph: 418-653-4422 Fax:

Report To: SAME.
Prov: PC:
Ph: Fax:

PO# / AFE#:
Quotation #: A90192
Project #: DLCU LANDFILL MONITORING PROJECT
Proj. Name: C311
Location: CAM-3 Shepherd Bay
Sampler's Initials: A.P.

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use
[ ] AT1 _____
[ ] CCME _____
[ ] OTHER _____

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):
apassalis@emts.net
jppelletier@biogenie-env.com

SERVICE REQUESTED:

[ ] RUSH (Please ensure you contact the lab to reserve)
Date Required: _____
[X] REGULAR Turnaround (5 to 7 Days)

	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	SOILS: BTEX/F1-F4 F1-F3	Sieve (75 micron)	Salinity 4	Regulated Metals (CCME / AT1)1	Assessment ICP Metals2	Paint Filter	Flashpoint	pH (1:1)	TCLP	BTEX	Metals	PCBs	Metals - see LIST	WATERS: TPH/R	Ammonia	TKN	COD	TOC	DOC	Total Preserved	Not Preserved	Dissolved Preserved	Not Preserved	Filtered	Not Filtered	Mercury	Total	Dissolved	PCB	OTHER TEST(S)	*HOLD for 60 Days	# of Containers Submitted
1	C311-4WA	S	15/8/11	X											X	X																		3
2	C311-4WB			X											X	X																		3
3	C311-5WA			X											X	X																		3
4	C311-5WB			X											X	X																		3
5	C311-6WA			X											X	X																		3
6	C311-6WB			X											X	X																		3
7	C311-7WA			X											X	X																		3
8	C311-7WB			X											X	X																		3
9	C311-12WA			X											X	X																		3
10	C311-12WB			X											X	X																		3
11	C311-13WA			X											X	X																		3
12	C311-13WB			X											X	X																		3

ARRIVED AT DEPOT:
AUG 18 2011
TEMP: 13/14/1N/1

Maxxam Job #: B76925

* All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.

Relinquished By: A. PASSALIS Date/Time: 16/8/11
Sign and Print:
COMMENTS/SPECIAL INSTRUCTIONS:
TOTAL METALS - Cu, Ni, Co, Cr, Cd, Pb, Zn, As, Hg ONLY

# JARS USED & NOT SUBMITTED	Received By	Temperature	Ice
	RECEIVED AUG 19 2011		
	CUSTODY SEAL YES / NO		

Maxxam

Success Through Science®

Your Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY

Attention: ANDREW PASSALIS
SILA REMEDIATION
4495 BL. WILFRED-HAMEL BUR 100
QUEBEC, PQ
CANADA GIP 2T7

Report Date: 2011/08/25

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B176925
Received: 2011/08/18, 12:20

Sample Matrix: Soil
Samples Received: 18

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	18	2011/08/19	2011/08/21	CAL SOP-00190	CCME CWS, EPA 8260C
CCME Hydrocarbons (F2-F4 in soil)	18	2011/08/19	2011/08/23	AB SOP-00040 AB SOP-00036	CCME PHC-CWS
Elements by ICPMS - Soils	18	2011/08/24	2011/08/25	AB SOP-00043	EPA 200.8
Moisture	18	N/A	2011/08/19	CAL SOP-00023	McKeague MSSMA 2.411
Polychlorinated Biphenyls	6	2011/08/19	2011/08/22	CAL SOP-00149	EPA 3550B, EPA 8082A
Polychlorinated Biphenyls	9	2011/08/19	2011/08/23	CAL SOP-00149	EPA 3550B, EPA 8082A
Polychlorinated Biphenyls	3	2011/08/19	2011/08/25	CAL SOP-00149	EPA 3550B, EPA 8082A

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cadmium - low level CCME (Total)	6	2011/08/19	2011/08/24	AB SOP-00043	EPA 200.8
Cadmium - low level CCME (Total)	1	2011/08/19	2011/08/25	AB SOP-00043	EPA 200.8
Mercury - Low Level (Total)	7	2011/08/22	2011/08/22	CAL SOP-00007	EPA 1631
Elements by ICPMS - Total	6	2011/08/23	2011/08/24	AB SOP-00043	EPA 200.8
Elements by ICPMS - Total	1	2011/08/23	2011/08/25	AB SOP-00043	EPA 200.8
Polychlorinated Biphenyls	7	2011/08/20	2011/08/22	CAL SOP-00149	EPA 3510C, EPA 8082A
Hydrocarbon by IR (Mineral oil & grease)	7	2011/08/22	2011/08/23	CAL SOP-00096	SM 5520C, F

* Results relate only to the items tested.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ioana Stoica, Project Manager
Email: IStoica@maxxam.ca
Phone# (403) 291-3077

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		BH4432	BH4575	BH4580	BH4581	BH4582	BH4583	BH4584	BH4585		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-4WA**	**C311-4WB**	**C311-5WA**	**C311-5WB**	**C311-6WA**	**C311-6WB**	**C311-7WA**	**C311-7WB**	**RDL**	**QC Batch**
Physical Properties											
Moisture	%	2.4	2.6	11	11	17	13	18	12	0.3	5109176
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	10	5111083
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	10	5111083
Reached Baseline at C50	mg/kg	YES	YES	YES	YES	YES	YES	YES	YES		5111083
Surrogate Recovery (%)											
O-TERPHENYL (sur.)	%	87	87	89	87	87	86	88	87		5111083
Volatiles											
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5109205
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5109205
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109205
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5109205
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5109205
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5109205
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	<12	<12	<12	12	5109205
(C6-C10)	mg/kg	<12	<12	<12	<12	<12	<12	<12	<12	12	5109205
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	99	99	99	106	106	99	105	99		5109205
4-BROMOFLUOROBENZENE (sur.)	%	80	80	80	83	88	78	86	80		5109205
D10-ETHYLBENZENE (sur.)	%	97	96	94	105	101	95	99	96		5109205
D4-1,2-DICHLOROETHANE (sur.)	%	83	81	82	87	88	82	90	82		5109205

RDL = Reportable Detection Limit

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		BH4586	BH4587	BH4588	BH4597		BH4598		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15		2011/08/15		
	Units	**C311-12WA**	**C311-12WB**	**C311-13WA**	**C311-13WB**	**RDL**	**C311-14WA**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	3.3	3.4	12	7.2	0.3	69	0.3	5109176
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	10	<60(1)	60	5111083
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	<10	<10	<10	10	<60(1)	60	5111083
Reached Baseline at C50	mg/kg	YES	YES	YES	YES		YES		5111083
Surrogate Recovery (%)									
O-TERPHENYL (sur.)	%	87	86	88	85		88		5111083
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	5109205
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	0.020	5109205
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	0.010	5109205
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	<0.040	0.040	5109205
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	<0.040	0.040	5109205
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	0.020	5109205
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	<12	12	5109205
(C6-C10)	mg/kg	<12	<12	<12	<12	12	<12	12	5109205
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	103	102	109	107		97		5109205
4-BROMOFLUOROBENZENE (sur.)	%	84	84	85	83		79		5109205
D10-ETHYLBENZENE (sur.)	%	106	102	109	104		86		5109205
D4-1,2-DICHLOROETHANE (sur.)	%	87	85	90	88		85		5109205

RDL = Reportable Detection Limit
(1) - Detection limits raised due to high moisture, sample contain >50% wt moisture.

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		BH4599	BH4600	BH4601	BH4603	BH4604		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-14WB**	**C311-15WA**	**C311-15WB**	**C311-BD1**	**C311-BD2**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	12	47	17	13	11	0.3	5109176
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	10	5111083
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	12	<10	<10	<10	10	5111083
Reached Baseline at C50	mg/kg	YES	YES	YES	YES	YES		5111083
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	85	87	86	88	86		5111083
Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	5109205
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5109205
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109205
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5109205
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5109205
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5109205
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	12	5109205
(C6-C10)	mg/kg	<12	<12	<12	<12	<12	12	5109205
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	108	98	105	109	105		5109205
4-BROMOFLUOROBENZENE (sur.)	%	89	80	85	81	86		5109205
D10-ETHYLBENZENE (sur.)	%	107	83	102	105	100		5109205
D4-1,2-DICHLOROETHANE (sur.)	%	95	86	89	87	87		5109205

RDL = Reportable Detection Limit

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		BH4658		BH4855	BH4856		BH4857		BH4858	BH4859	BH4860		
Sampling Date		2011/08/15		2011/08/15	2011/08/15		2011/08/15		2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-7W**	**RDL**	**C311-13W**	**C311-14W**	**QC Batch**	**C311-15W**	**QC Batch**	**C311-BDW1**	**C311-FB**	**C311-TB**	**RDL**	**QC Batch**
Low Level Elements													
Total Cadmium (Cd)	ug/L	0.29	0.005	0.070	0.29	5106366	0.25	5106366	0.24	<0.005	<0.005	0.005	5106366
Elements													
Total Arsenic (As)	mg/L	0.021	0.0002	0.0048	0.017	5115817	0.0079	5121457	0.011	<0.0002	<0.0002	0.0002	5115817
Total Cadmium (Cd)	mg/L	0.00029	0.000005	0.000070	0.00029	5115817	0.00025	5121457	0.00024	<0.000005	<0.000005	0.000005	5115817
Total Chromium (Cr)	mg/L	0.29	0.001	0.038	0.092	5115817	0.076	5121457	0.11	<0.001	<0.001	0.001	5115817
Total Cobalt (Co)	mg/L	0.018	0.0003	0.0040	0.014	5115817	0.0072	5121457	0.0099	<0.0003	<0.0003	0.0003	5115817
Total Copper (Cu)	mg/L	0.054	0.0002	0.012	0.13	5115817	0.022	5121457	0.026	<0.0002	<0.0002	0.0002	5115817
Total Lead (Pb)	mg/L	0.029	0.0002	0.0062	0.036	5115817	0.011	5121457	0.015	<0.0002	<0.0002	0.0002	5115817
Total Nickel (Ni)	mg/L	0.17	0.0005	0.028	0.11	5115817	0.041	5121457	0.056	<0.0005	<0.0005	0.0005	5115817
Total Zinc (Zn)	mg/L	2.3(1)	0.008	0.12	0.32	5115817	0.14	5121457	0.12	<0.003	<0.003	0.003	5115817

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		BH4432	BH4575	BH4580	BH4581	BH4582	BH4583		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-4WA**	**C311-4WB**	**C311-5WA**	**C311-5WB**	**C311-6WA**	**C311-6WB**	**RDL**	**QC Batch**
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Total Aroclors	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	111	114	129	114	121	113		5109401

RDL = Reportable Detection Limit
(1) - Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		BH4584	BH4585	BH4586	BH4587	BH4588	BH4597		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-7WA**	**C311-7WB**	**C311-12WA**	**C311-12WB**	**C311-13WA**	**C311-13WB**	**RDL**	**QC Batch**
Polychlorinated Biphenyls									
Aroclor 1016	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1221	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1232	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1242	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1248	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1254	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1260	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1262	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1268	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Total Aroclors	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Surrogate Recovery (%)									
NONACHLOROBIPHENYL (sur.)	%	107	105	112	104	105	101		5109401

Maxxam ID		BH4598		BH4599	BH4600	BH4601	BH4603	BH4604		
Sampling Date		2011/08/15		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-14WA**	**RDL**	**C311-14WB**	**C311-15WA**	**C311-15WB**	**C311-BD1**	**C311-BD2**	**RDL**	**QC Batch**
Polychlorinated Biphenyls										
Aroclor 1016	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1221	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1232	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1242	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1248	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1254	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1260	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1262	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Aroclor 1268	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Total Aroclors	mg/kg	<0.061	0.061	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5109401
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	106		113	100	104	107	104		5109401

RDL = Reportable Detection Limit

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		BH4432	BH4575	BH4580	BH4581	BH4582	BH4583	BH4584	BH4585	BH4586		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-4WA**	**C311-4WB**	**C311-5WA**	**C311-5WB**	**C311-6WA**	**C311-6WB**	**C311-7WA**	**C311-7WB**	**C311-12WA**	**RDL**	**QC Batch**
Elements												
Total Arsenic (As)	mg/kg	4	4	3	3	4	4	3	3	<1	1	5121888
Total Cadmium (Cd)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	5121888
Total Chromium (Cr)	mg/kg	11	17	18	19	15	16	13	16	5	1	5121888
Total Cobalt (Co)	mg/kg	3	3	4	4	4	3	3	4	2	1	5121888
Total Copper (Cu)	mg/kg	<5	<5	6	6	<5	<5	<5	<5	<5	5	5121888
Total Lead (Pb)	mg/kg	4	5	6	7	6	6	5	6	2	1	5121888
Total Mercury (Hg)	mg/kg	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	5121888
Total Nickel (Ni)	mg/kg	7	8	10	10	8	8	8	9	2	1	5121888
Total Zinc (Zn)	mg/kg	<10	<10	<10	<10	<10	<10	11	<10	<10	10	5121888

Maxxam ID		BH4587	BH4588	BH4597		BH4598		BH4599	BH4600	BH4601	BH4603		
Sampling Date		2011/08/15	2011/08/15	2011/08/15		2011/08/15		2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-12WB**	**C311-13WA**	**C311-13WB**	**RDL**	**C311-14WA**	**RDL**	**C311-14WB**	**C311-15WA**	**C311-15WB**	**C311-BD1**	**RDL**	**QC Batch**
Elements													
Total Arsenic (As)	mg/kg	<1	1	2	1	<2	2	2	1	2	3	1	5121888
Total Cadmium (Cd)	mg/kg	<0.1	<0.1	<0.1	0.1	<0.2	0.2	<0.1	<0.1	<0.1	<0.1	0.1	5121888
Total Chromium (Cr)	mg/kg	3	6	5	1	4	2	9	2	4	6	1	5121888
Total Cobalt (Co)	mg/kg	1	2	2	1	3	2	4	1	1	2	1	5121888
Total Copper (Cu)	mg/kg	<5	<5	<5	5	15	10	6	9	14	<5	5	5121888
Total Lead (Pb)	mg/kg	1	3	3	1	3	2	5	2	2	3	1	5121888
Total Mercury (Hg)	mg/kg	<0.05	<0.05	<0.05	0.05	<0.1	0.1	<0.05	<0.05	0.05	<0.05	0.05	5121888
Total Nickel (Ni)	mg/kg	2	3	3	1	3	2	5	2	2	3	1	5121888
Total Zinc (Zn)	mg/kg	<10	<10	<10	10	66	20	18	<10	<10	<10	10	5121888

RDL = Reportable Detection Limit

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		BH4604		
Sampling Date		2011/08/15		
	Units	**C311-BD2**	**RDL**	**QC Batch**
Elements				
Total Arsenic (As)	mg/kg	3	1	5121888
Total Cadmium (Cd)	mg/kg	<0.1	0.1	5121888
Total Chromium (Cr)	mg/kg	19	1	5121888
Total Cobalt (Co)	mg/kg	4	1	5121888
Total Copper (Cu)	mg/kg	6	5	5121888
Total Lead (Pb)	mg/kg	7	1	5121888
Total Mercury (Hg)	mg/kg	<0.05	0.05	5121888
Total Nickel (Ni)	mg/kg	11	1	5121888
Total Zinc (Zn)	mg/kg	<10	10	5121888

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		BH4658	BH4855	BH4856	BH4857	BH4858	BH4859	BH4860		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-7W**	**C311-13W**	**C311-14W**	**C311-15W**	**C311-BDW1**	**C311-FB**	**C311-TB**	**RDL**	**QC Batch**
Misc. Organics										
Total Petroleum Hydrocarbon	mg/L	<2	<2	<2	<2	<2	<2	<2	2	5110177

RDL = Reportable Detection Limit

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		BH4658	BH4855	BH4856	BH4857	BH4858	BH4859	BH4860		
Sampling Date		2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-7W**	**C311-13W**	**C311-14W**	**C311-15W**	**C311-BDW1**	**C311-FB**	**C311-TB**	**RDL**	**QC Batch**
Polychlorinated Biphenyls										
Aroclor 1016	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1221	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1232	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1242	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1248	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1254	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1260	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1262	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Aroclor 1268	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Total Aroclors	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	5109739
Surrogate Recovery (%)										
NONACHLOROBIPHENYL (sur.)	%	99	102	98	105	104	106	104		5109739

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BH4658	BH4855	BH4856		BH4857	BH4858	BH4859	BH4860		
Sampling Date		2011/08/15	2011/08/15	2011/08/15		2011/08/15	2011/08/15	2011/08/15	2011/08/15		
	Units	**C311-7W**	**C311-13W**	**C311-14W**	**RDL**	**C311-15W**	**C311-BDW1**	**C311-FB**	**C311-TB**	**RDL**	**QC Batch**
Low Level Elements											
Total Mercury (Hg)	ug/L	0.044(1)	0.014(1)	0.059(1)	0.006	0.013	0.003	0.004	0.004	0.002	5110907

RDL = Reportable Detection Limit
(1) - Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

Package 1	12.7°C
Package 2	8.7°C
Package 3	6.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Detection limits raised due to high moisture, sample contain >50% wt moisture.

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL) Comments

Sample BH4598-01 Polychlorinated Biphenyls: Detection limits raised due to matrix interference

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL) Comments

Sample BH4598-01 Elements by ICPMS - Soils: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
5109176	Moisture	2011/08/19							5.3	20		
5109205	1,4-Difluorobenzene (sur.)	2011/08/21	95	60 - 140	97	60 - 140	105	%				
5109205	4-BROMOFLUOROBENZENE (sur.)	2011/08/21	91	60 - 140	95	60 - 140	85	%				
5109205	D10-ETHYLBENZENE (sur.)	2011/08/21	98	60 - 130	102	60 - 130	120	%				
5109205	D4-1,2-DICHLOROETHANE (sur.)	2011/08/21	88	60 - 140	86	60 - 140	91	%				
5109205	Benzene	2011/08/21	94	60 - 140	89	60 - 140	<0.0050	mg/kg	NC	50		
5109205	Toluene	2011/08/21	96	60 - 140	91	60 - 140	<0.020	mg/kg	NC	50		
5109205	Ethylbenzene	2011/08/21	94	60 - 140	89	60 - 140	<0.010	mg/kg	NC	50		
5109205	m & p-Xylene	2011/08/21	96	60 - 140	92	60 - 140	<0.040	mg/kg	NC	50		
5109205	o-Xylene	2011/08/21	99	60 - 140	93	60 - 140	<0.020	mg/kg	NC	50		
5109205	(C6-C10)	2011/08/21	101	60 - 140	101	60 - 140	<12	mg/kg	NC	50		
5109205	Xylenes (Total)	2011/08/21					<0.040	mg/kg	NC	50		
5109205	F1 (C6-C10) - BTEX	2011/08/21					<12	mg/kg	NC	50		
5109401	NONACHLOROBIPHENYL (sur.)	2011/08/22	109	30 - 130	102	30 - 130	109	%				
5109401	Aroclor 1260	2011/08/22	112	30 - 130	118	30 - 130	<0.010	mg/kg	NC	50		
5109401	Aroclor 1016	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1221	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1232	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1242	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1248	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1254	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1262	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Aroclor 1268	2011/08/22					<0.010	mg/kg	NC	50		
5109401	Total Aroclors	2011/08/22					<0.010	mg/kg	NC	50		
5109739	NONACHLOROBIPHENYL (sur.)	2011/08/22			109	30 - 130	102	%				
5109739	Aroclor 1260	2011/08/22			92	30 - 130	<0.000050	mg/L				
5109739	Aroclor 1016	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1221	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1232	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1242	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1248	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1254	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1262	2011/08/22					<0.000050	mg/L				
5109739	Aroclor 1268	2011/08/22					<0.000050	mg/L				
5109739	Total Aroclors	2011/08/22					<0.000050	mg/L				
5110177	Total Petroleum Hydrocarbon	2011/08/23			101	70 - 130	<2	mg/L				
5110907	Total Mercury (Hg)	2011/08/22			112	80 - 120	0.003, RDL=0.002	ug/L	5.7	20		
5111083	O-TERPHENYL (sur.)	2011/08/23	82	50 - 130	79	50 - 130	86	%				
5111083	F2 (C10-C16 Hydrocarbons)	2011/08/23	91	50 - 130	94	70 - 130	<10	mg/kg	NC	50		
5111083	F3 (C16-C34 Hydrocarbons)	2011/08/23	96	50 - 130	100	70 - 130	<10	mg/kg	NC	50		

Maxxam Job #: B176925
Report Date: 2011/08/25

SILA REMEDIATION
Client Project #: DLCU LANDFILL MONITORING
Site Location: CAM-3 SHEPHERD BAY
Sampler Initials: AP

QUALITY ASSURANCE REPORT

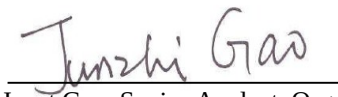
			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
5115817	Total Arsenic (As)	2011/08/24	89	80 - 120	92	80 - 120	<0.0002	mg/L	2.9	20		
5115817	Total Cadmium (Cd)	2011/08/24	95	80 - 120	97	80 - 120	<0.000005	mg/L	5.7	20		
5115817	Total Chromium (Cr)	2011/08/24	NC	80 - 120	98	80 - 120	<0.001	mg/L	13.0	20		
5115817	Total Cobalt (Co)	2011/08/24	95	80 - 120	99	80 - 120	<0.0003	mg/L	3.4	20		
5115817	Total Copper (Cu)	2011/08/24	88	80 - 120	99	80 - 120	<0.0002	mg/L	3.0	20		
5115817	Total Lead (Pb)	2011/08/24	89	80 - 120	99	80 - 120	<0.0002	mg/L	2.0	20		
5115817	Total Nickel (Ni)	2011/08/24	NC	80 - 120	102	80 - 120	<0.0005	mg/L	8.4	20		
5115817	Total Zinc (Zn)	2011/08/24	NC	80 - 120	93	80 - 120	<0.003	mg/L	6.9	20		
5121457	Total Arsenic (As)	2011/08/25	93	80 - 120	95	80 - 120	<0.0002	mg/L	NC	20		
5121457	Total Cadmium (Cd)	2011/08/25	99	80 - 120	100	80 - 120	<0.000005	mg/L				
5121457	Total Chromium (Cr)	2011/08/25	99	80 - 120	101	80 - 120	<0.001	mg/L	NC	20		
5121457	Total Cobalt (Co)	2011/08/25	98	80 - 120	102	80 - 120	<0.0003	mg/L	NC	20		
5121457	Total Copper (Cu)	2011/08/25	96	80 - 120	103	80 - 120	0.0003, RDL=0.0002	mg/L	11.2	20		
5121457	Total Lead (Pb)	2011/08/25	101	80 - 120	103	80 - 120	<0.0002	mg/L	7.8	20		
5121457	Total Nickel (Ni)	2011/08/25	98	80 - 120	105	80 - 120	<0.0005	mg/L	NC	20		
5121457	Total Zinc (Zn)	2011/08/25	95	80 - 120	94	80 - 120	<0.003	mg/L	NC	20		
5121888	Total Arsenic (As)	2011/08/25	93	75 - 125	90	75 - 125	<1	mg/kg	NC	35	105	50 - 150
5121888	Total Cadmium (Cd)	2011/08/25	100	75 - 125	94	75 - 125	<0.1	mg/kg	NC	35		
5121888	Total Chromium (Cr)	2011/08/25	105	75 - 125	96	75 - 125	<1	mg/kg	1.9	35	105	41 - 159
5121888	Total Cobalt (Co)	2011/08/25	102	75 - 125	96	75 - 125	<1	mg/kg	NC	35	104	75 - 125
5121888	Total Copper (Cu)	2011/08/25	92	75 - 125	95	75 - 125	<5	mg/kg	NC	35	94	72 - 127
5121888	Total Lead (Pb)	2011/08/25	95	75 - 125	99	75 - 125	<1	mg/kg	NC	35	101	54 - 146
5121888	Total Mercury (Hg)	2011/08/25	96	75 - 125	98	75 - 125	0.09, RDL=0.05	mg/kg	NC	35		
5121888	Total Nickel (Ni)	2011/08/25	97	75 - 125	99	75 - 125	<1	mg/kg	2.6	35	105	61 - 139
5121888	Total Zinc (Zn)	2011/08/25	95	75 - 125	97	75 - 125	<10	mg/kg	NC	35	96	72 - 128

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

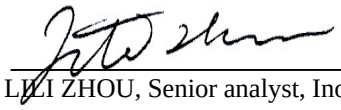
Validation Signature Page

Maxxam Job #: B176925

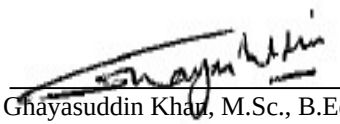
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Janet Gao, Senior Analyst, Organics Department



LILI ZHOU, Senior analyst, Inorganic department.



Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Senior Analyst, Water Lab

LUBA SHYMUSHOVSKA, Senior Analyst, Organic Department

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Page: 1 of 3

Invoice To:	Require Report? Yes [X] No [ ]
Company Name:	SILA REMEDIATIONS (Client# 4781)
Contact Name:	J.P. PELLETIER
Address:	4495 WILFRID-HAMEL BLVD, SUITE 200
Prov: QUEBEC, QUEBEC	PC:
Contact #s: Ph: 418-653-4422	Fax:

Report To:	SAME.
Prov:	PC:
Ph:	Fax:

PO# / AFE#:	
Quotation #:	A90192
Project #:	DLCU LANDFILL MONITORING PROJECT
Proj. Name:	C311
Location:	CAM-3 Shepherd Bay
Sampler's Initials:	A.P.

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use

- [ ] AT1
- [ ] CCME
- [ ] OTHER

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):

apassalis@mts.net

jppelletier@biogenie-env.com

SERVICE REQUESTED:

- [ ] RUSH (Please ensure you contact the lab to reserve)

Date Required:

- [X] REGULAR Turnaround (5 to 7 Days)

SOILS (footnotes defined on back): BTEX F1-F4 (F1-F3); Sieve (75 micron); Salinity 4; Regulated Metals (CCME / AT1)1; Assessment ICP Metals2; ☐ Paint Filter ☐ Flashpoint ☐ pH (1:1); TCLP ☐ BTEX ☐ Metals; PCBs; Metals - see LIST

WATERS (footnotes defined on back): TPHIR; ☐ Ammonia ☐ TKN ☐ COD; ☐ TOC ☐ DOC; REGULATED METALS (CCME / AT1)3: Total ☐ Preserved ☒ Not Preserved (See LIST); Dissolved ☐ Preserved ☐ Not Preserved ☐ Filtered ☐ Not Filtered; Mercury ☐ Total ☐ Dissolved; PCB

OTHER TEST(S)

	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	BTEX F1-F3	PCBs	Metals - see LIST	*HOLD for 60 Days	# of Containers Submitted
1	C311-4WA	S	15/8/11	X	X	X		3
2	C311-4WB	(	(	X	X	X		3
3	C311-5WA			X	X	X		3
4	C311-5WB			X	X	X		3
5	C311-6WA			X	X	X		3
6	C311-6WB			X	X	X		3
7	C311-7WA			X	X	X		3
8	C311-7WB			X	X	X		3
9	C311-12WA			X	X	X		3
10	C311-12WB			X	X	X		3
11	C311-13WA			X	X	X		3
12	C311-13WB	)	)	X	X	X		3

ARRIVED AT DEPOT: AUG 18 2011 1220

TEMP: 13/14/11/11

Maxxam Job #: B176925

** All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.*

Relinquished By: [signature] Date/Time: 16/8/11

Sign and Print: A. PASSALIS

COMMENTS/SPECIAL INSTRUCTIONS:

TOTAL METALS - Cu, Ni, Co, Cr, Cd, Pb, Zn, As, Hg ONLY

# JARS USED & NOT SUBMITTED	Received By	Temperature	Ice
	RECEIVED AUG 19 2011		
	CUSTODY SEAL YES / NO		

[signature] 0800

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Invoice To:	Report To:	
Require Report? Yes [X] No [ ]		PO# / AFE#:
Company Name: SILA REMEDIATIONS (Client# 4781)		Quotation #: A90192
Contact Name: J.P. Pelletier		Project #: DLCU LANDFILL MONITORING PROJECT
Address:		Proj. Name:
Prov: PC:	Prov: PC:	Location: CAM-3
Contact #s: Ph: 418-653-4422 Fax:	Ph: Fax:	Sampler's Initials:

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use

- [ ] AT1 _____
- [ ] CCME _____
- [ ] OTHER _____

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):

apassalis@emts.net

jppelletier@biogenie-env.com.

SERVICE REQUESTED:

- [ ] RUSH (Please ensure you contact the lab to reserve)

Date Required: _____

- [X] REGULAR Turnaround (5 to 7 Days)

	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	SOILS (footnotes defined on back): ~~BTEX F1-F4~~ F1-F3	Sieve (75 micron)	Salinity 4	Regulated Metals (CCME / AT1)1	Assessment ICP Metals2	Paint Filter ☐ Flashpoint ☐ pH (1:1)	TCLP ☐ BTEX ☐ Metals	PCBs	Metals - see List	WATERS (footnotes defined on back): TPHfR	☐ Ammonia ☐ TKN ☐ COD	☐ TOC ☐ DOC	REGULATED METALS (CCME / AT1)3: Total ☐ Preserved ☐ Not Preserved (See List)	Dissolved ☐ Preserved ☐ Not Preserved ☐ Filtered ☐ Not Filtered	Mercury ☐ Total ☐ Dissolved	PCB	OTHER TEST(S)	*HOLD for 60 Days	# of Containers Submitted
1	C311-14WA	S	15/8/11	X							X	X	X			X			X			3
2	C311-15WB			X							X	X	X			X			X			3
3	C311-15WA			X							X	X										3
4	C311-15WB			X							X	X										3
5	C311-BD1			X							X	X										3
6	C311-BD2			X							X	X										3
7	C311-7W	W	15/8/11										X			X			X		ARRIVED AT DEPOT:	4
8	C311-13W												X			X			X		AUG 18 2011	4
9	C311-14W												X			X			X			4
10	C311-15W												X			X			X		TEMP: 9/8/9/	4
11	C311-BDW1												X			X			X			4
12																						

Maxxam Job #: B176925

All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.

Relinquished By: _____ Date/Time: 16/8/11

Sign and Print: A. PASSALIS

COMMENTS/SPECIAL INSTRUCTIONS:

TOTAL METALS - Cu, Ni, Co, Cr, Cd, Pb, Zn, As, Hg

# JARS USED & NOT SUBMITTED	Received By	Temperature	Ice
	RECEIVED AUG 19 2011		
	CUSTODY SEAL YES / NO		

JED 080C

Maxxam Analytics

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 465-1212, Fax: (780) 450-4187, Toll free: (877) 465-8889

Chain of Custody

Page: 3 of 3

Invoice To:	Require Report? Yes [X] No [ ]
Company Name:	SILA REMEDIATIONS (Client# 4781)
Contact Name:	JP. Pelletier
Address:	
	Prov: PC:
Contact #s:	Ph: Fax:

Report To:	
Prov:	PC:
Ph:	Fax:

PO# / AFE#:	
Quotation #:	A90192
Project #:	DLCU LANDFILL MONITORING PROJECT
Proj. Name:	
Location:	CAM-3
Sampler's Initials:	

DETECTION LIMIT REQUIREMENTS:

Check the applicable criterion and indicate land use

- [ ] AT1 ________
- [ ] CCME ________
- [ ] OTHER ________

REPORT DISTRIBUTION:

EMAIL ADDRESS(S):

apassalis@mts.net

jppelletier@biogenie-env.com

SERVICE REQUESTED:

- [ ] **RUSH** (Please ensure you contact the lab to reserve)
  Date Required: ________
- [X] REGULAR Turnaround (5 to 7 Days)

#	Sample Identification	Matrix S/W	Date & Time Sampled Year/Month/Day	SOILS: BTEX F1-F4	Sieve (75 micron)	Salinity 4	Regulated Metals (CCME / AT1)1	Assessment ICP Metals2	☐ Paint Filter ☐ Flashpoint ☐ pH (1:1)	TCLP ☐ BTEX ☐ Metals			WATERS: TPHIR	☐ Ammonia ☐ TKN ☐ COD	☐ TOC ☐ DOC	REGULATED METALS (CCME / AT1)3 Total ☐ Preserved ☒ Not Preserved (See List)	REGULATED METALS Dissolved ☐ Preserved ☐ Not Preserved ☐ Filtered ☐ Not Filtered	Mercury ☐ Total ☐ Dissolved	PCB		OTHER TEST(S)							*HOLD for 60 Days	# of Containers Submitted
1	C311-FB	W	15/8/11										X			X			X										4
2	C311-TB	"											X			X			X										4
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ARRIVED AT DEPOT:
AUG 18 2011
TEMP: 7/6/7/1 / 2/2/2

** All samples are held for 60 calendar days after sample receipt. For long term storage please contact your project manager.*

Maxxam Job #: B176925

Relinquished By: [signature] **Date/Time:** 16/8/11

Sign and Print: A-PASSALIS

COMMENTS/SPECIAL INSTRUCTIONS:

TOTAL METALS - Cu, Ni, Co, Cr, Cd, Pb, Zn, As, Hg.

# JARS USED & NOT SUBMITTED	Received By	Temperature			Ice
	RECEIVED AUG 19 2011				
	CUSTODY SEAL YES / NO				

[signature] 0806

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522
F: +1 (780) 438-0396
E: Edmonton@exova.com
W: www.exova.com

Report Transmission Cover Page

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Contact & Affiliation	Address	Delivery Commitments
Accounts Payable Sila Remediation Inc.	200,4495 Boul. Wilfrid-Hamel Quebec City, Quebec G1P 2J7 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: n/a	On [Lot Approval and Final Test Report Approval] send (Invoice) by Post M
JP Pelletiere Sila Remediation Inc.	200,4495 Boul. Wilfrid-Hamel Quebec City, Quebec G1P 2J7 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: jppelletier@biogenie-env.com	On [Lot Verification] send (COA, COC) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Merge Reports
A Passalis EGE	511 Pepperloaf Cres. Winnipeg, Manitoba R3R 1E6 Phone: (204) 837-6473 Fax: (204) 837-6473 Email: apassalis@mts.net	On [Lot Verification] send (COA, COC) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Merge Reports

Notes To Clients:

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522
F: +1 (780) 438-0396
E: Edmonton@exova.com
W: www.exova.com

Sample Custody

Bill To:	Sila Remediation Inc.	Project:	
Report To:	EGE	ID:	
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring
	Winnipeg, MB, Canada	Location:	
	R3R 1E6	LSD:	
Attn:	A Passalis	P.O.:	
Sampled By:		Acct code:	
Company:			

Lot ID:	**821266**
Control Number:	89707
Date Received:	Aug 19, 2011
Date Reported:	Aug 29, 2011
Report Number:	1462516

Sample Disposal Date: September 28, 2011

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522
F: +1 (780) 438-0396
E: Edmonton@exova.com
W: www.exova.com

Exova

Analytical Report

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Reference Number	821266-1	821266-2
Sample Date	Aug 15, 2011	Aug 15, 2011
Sample Time	NA	NA
Sample Location		
Sample Description	C311-5WA / 15.3°C	C311-5WB / 15.3°C
Matrix	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Hot Water Soluble						
Boron	Hot Water Soluble	mg/kg	<0.2	1.1		0.2
Metals Strong Acid Digestion						
Mercury	Strong Acid Extractable	mg/kg	0.01	0.01		0.01
Antimony	Strong Acid Extractable	mg/kg	<0.2	<0.2		0.2
Arsenic	Strong Acid Extractable	mg/kg	3.4	1.6		0.2
Barium	Strong Acid Extractable	mg/kg	17	8		1
Beryllium	Strong Acid Extractable	mg/kg	0.6	0.1		0.1
Cadmium	Strong Acid Extractable	mg/kg	0.03	0.01		0.01
Chromium	Strong Acid Extractable	mg/kg	21.5	4.1		0.1
Cobalt	Strong Acid Extractable	mg/kg	4.8	1.4		0.1
Copper	Strong Acid Extractable	mg/kg	8	6		1
Lead	Strong Acid Extractable	mg/kg	8.0	2.5		0.1
Molybdenum	Strong Acid Extractable	mg/kg	<1	<1		1
Nickel	Strong Acid Extractable	mg/kg	12.8	2.2		0.5
Selenium	Strong Acid Extractable	mg/kg	0.6	0.3		0.3
Silver	Strong Acid Extractable	mg/kg	0.1	0.1		0.1
Thallium	Strong Acid Extractable	mg/kg	0.13	<0.05		0.05
Tin	Strong Acid Extractable	mg/kg	<1	<1		1
Uranium	Strong Acid Extractable	mg/kg	<0.5	0.6		0.5
Vanadium	Strong Acid Extractable	mg/kg	28.1	8.1		0.1
Zinc	Strong Acid Extractable	mg/kg	13	5		1
Mono-Aromatic Hydrocarbons - Soil						
Extraction Date			22-Aug-11	22-Aug-11		
Benzene	Dry Weight	mg/kg	<0.004	<0.004		0.004
Toluene	Dry Weight	mg/kg	<0.005	0.034		0.005
Ethylbenzene	Dry Weight	mg/kg	<0.010	<0.010		0.010
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.010	<0.010		0.010
Volatile Petroleum Hydrocarbons - Soil						
Extraction Date			22-Aug-11	22-Aug-11		
F1 C6-C10	Dry Weight	mg/kg	<4	<4		4
F1 -BTEX	Dry Weight	mg/kg	<4	<4		4
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date			22-Aug-11	22-Aug-11		
F2c C10-C16	Dry Weight	mg/kg	<10	<10		10
F3c C16-C34	Dry Weight	mg/kg	<30	<30		30
F4c C34-C50	Dry Weight	mg/kg	<20	<20		20

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Analytical Report

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Reference Number	821266-1	821266-2	
Sample Date	Aug 15, 2011	Aug 15, 2011	
Sample Time	NA	NA	
Sample Location			
Sample Description	C311-5WA / 15.3°C	C311-5WB / 15.3°C	
Matrix	Soil	Soil	

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Extractable Petroleum Hydrocarbons - Soil - Continued						
F4HTGCc C34-C50+	Dry Weight	mg/kg	<20	<20		20
% C50+		%	<5	<5		
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done		
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	12.20	17.80		
Polychlorinated Biphenyls - Soil						
Aroclor 1016	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1221	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1232	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1242	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1248	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1254	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1260	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1262	Dry Weight	mg/kg	<0.1	<0.1		0.1
Aroclor 1268	Dry Weight	mg/kg	<0.1	<0.1		0.1
Total PCBs	Dry Weight	mg/kg	<0.1	<0.1		0.1
Polychlorinated Biphenyls - Soil - Surrogate						
Decachlorobiphenyl	Surrogate	%	120	130		50-150

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Analytical Report

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Reference Number	821266-3
Sample Date	Aug 15, 2011
Sample Time	NA
Sample Location	
Sample Description	C311-13W / 15.3°C
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total						
Aluminum	Total	mg/L	47.1			0.02
Calcium	Total	mg/L	316			0.2
Iron	Total	mg/L	30.5			0.05
Magnesium	Total	mg/L	262			0.1
Manganese	Total	mg/L	0.523			0.005
Potassium	Total	mg/L	35.0			0.4
Silicon	Total	mg/L	42.0			0.05
Sodium	Total	mg/L	377			0.4
Sulfur	Total	mg/L	49.2			0.3
Mercury	Total	mg/L	<0.0001			0.0001
Antimony	Total	mg/L	0.001			0.0002
Arsenic	Total	mg/L	0.012			0.0002
Barium	Total	mg/L	0.259			0.001
Beryllium	Total	mg/L	0.001			0.0001
Bismuth	Total	mg/L	<0.001			0.0005
Boron	Total	mg/L	0.18			0.002
Cadmium	Total	mg/L	0.00020			0.00001
Chromium	Total	mg/L	0.0742			0.0005
Cobalt	Total	mg/L	0.011			0.0001
Copper	Total	mg/L	0.035			0.001
Lead	Total	mg/L	0.017			0.0001
Lithium	Total	mg/L	0.17			0.001
Molybdenum	Total	mg/L	0.01			0.001
Nickel	Total	mg/L	0.0349			0.0005
Selenium	Total	mg/L	<0.0004			0.0002
Silver	Total	mg/L	0.00034			0.00001
Strontium	Total	mg/L	0.639			0.001
Thallium	Total	mg/L	0.00055			0.00005
Tin	Total	mg/L	<0.002			0.001
Titanium	Total	mg/L	2.27			0.0005
Uranium	Total	mg/L	0.014			0.0005
Vanadium	Total	mg/L	0.0857			0.0001
Zinc	Total	mg/L	0.311			0.001
Zirconium	Total	mg/L	0.039			0.001
Mono-Aromatic Hydrocarbons - Water						
Benzene		mg/L	<0.001			0.001

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Analytical Report

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Reference Number	821266-3
Sample Date	Aug 15, 2011
Sample Time	NA
Sample Location	
Sample Description	C311-13W / 15.3°C
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Water - Continued						
Toluene		mg/L	<0.001			0.001
Ethylbenzene		mg/L	<0.001			0.001
Total Xylenes (m,p,o)		mg/L	<0.001			0.001
Volatile Petroleum Hydrocarbons - Water						
F1 -BTEX		mg/L	<0.2			0.2
F1 C6-C10		mg/L	<0.2			0.2
Extractable Petroleum Hydrocarbons - Water						
F2 C10-C16		mg/L	<0.1			0.1
F3 C16-C34		mg/L	<0.1			0.1
F3+ C34+		mg/L	<0.1			0.1
Polychlorinated Biphenyls - Water						
Aroclor 1016		ug/L	<0.1			0.1
Aroclor 1221		ug/L	<0.1			0.1
Aroclor 1232		ug/L	<0.1			0.1
Aroclor 1242		ug/L	<0.1			0.1
Aroclor 1248		ug/L	<0.1			0.1
Aroclor 1254		ug/L	<0.1			0.1
Aroclor 1260		ug/L	<0.1			0.1
Aroclor 1262		ug/L	<0.1			0.1
Aroclor 1268		ug/L	<0.1			0.1
Total PCBs		ug/L	<0.1			0.1
Polychlorinated Biphenyls - Water - Surrogate						
Decachlorobiphenyl	Surrogate	%	88			50-150

Approved by:

Randy Neumann, BSc
General Manager

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Quality Control

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Hot Water Soluble

Blanks	Units	Measured	Lower Limit	Upper Limit		Passed QC
Boron	mg/L	0.0209	-0.0	0.0		yes
Date Acquired:	August 25, 2011					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Boron	mg/kg	0.2	0.3	10	0.1	yes
Date Acquired:	August 25, 2011					

Control Sample	Units	Measured	Lower Limit	Upper Limit		Passed QC
Boron	mg/kg	0.8	0.7	1.0		yes
Date Acquired:	August 25, 2011					
Boron	mg/kg	0.1	0.1	0.1		yes
Date Acquired:	August 25, 2011					

Metals Strong Acid Digestion

Blanks	Units	Measured	Lower Limit	Upper Limit		Passed QC
Mercury	ug/L	0.03	-0.07	0.13		yes
Antimony	ug/L	0.059	-0.1	0.2		yes
Arsenic	ug/L	0.072	-0.2	0.2		yes
Barium	ug/L	0.051	-0	1		yes
Beryllium	ug/L	0.003	-0.1	0.1		yes
Cadmium	ug/L	0.001	-0.01	0.01		yes
Chromium	ug/L	0.085	-0.4	0.4		yes
Cobalt	ug/L	0.004	-0.1	0.1		yes
Copper	ug/L	0.278	-0.6	1.2		yes
Lead	ug/L	0.055	-0.1	0.1		yes
Molybdenum	ug/L	0.1	-0.6	0.6		yes
Nickel	ug/L	0.149	-0.4	0.7		yes
Selenium	ug/L	0.082	-0.3	0.3		yes
Silver	ug/L	0.087	-0.09	0.14		yes
Thallium	ug/L	-0.028	-0.04	0.04		yes
Tin	ug/L	4.392	0.0	7.2		yes
Uranium	ug/L	0.0027	-0.2	0.2		yes
Vanadium	ug/L	0.037	-0.1	0.1		yes
Zinc	ug/L	0.825	-1	1		yes
Date Acquired:	August 25, 2011					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Mercury	mg/kg	0.06	0.05	10	0.03	yes
Antimony	mg/kg	0.3	0.3	20	0.4	yes
Arsenic	mg/kg	5.3	5.4	20	0.4	yes
Barium	mg/kg	811	786	20	2	yes
Beryllium	mg/kg	0.7	0.6	20	0.2	yes

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Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
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	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Metals Strong Acid Digestion - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Cadmium	mg/kg	0.94	0.94	20	0.02	yes
Chromium	mg/kg	4.7	4.2	20	1.1	yes
Cobalt	mg/kg	14.5	12.9	20	0.2	yes
Copper	mg/kg	26	26	20	2.2	yes
Lead	mg/kg	6.8	7.1	20	0.2	yes
Molybdenum	mg/kg	1	2	20	2.2	yes
Nickel	mg/kg	28.8	29.5	20	1.1	yes
Selenium	mg/kg	1.5	1.3	20	0.7	yes
Silver	mg/kg	0.3	0.4	20	0.22	yes
Thallium	mg/kg	0.13	0.14	20	0.11	yes
Tin	mg/kg	4	4	20	2.2	yes
Uranium	mg/kg	5.8	5.8	20	1.1	yes
Vanadium	mg/kg	9.5	8.4	20	0.2	yes
Zinc	mg/kg	59	59	20	2	yes
Date Acquired:	August 25, 2011					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Antimony	mg/kg	38.6	35.8	43.6	yes
Arsenic	mg/kg	41.3	37.7	44.7	yes
Barium	mg/kg	192	184	209	yes
Beryllium	mg/kg	19.2	17.4	22.2	yes
Cadmium	mg/kg	2.06	1.92	2.20	yes
Chromium	mg/kg	98.8	92.2	105.8	yes
Cobalt	mg/kg	21.2	19.2	22.6	yes
Copper	mg/kg	194	176.3	207.3	yes
Lead	mg/kg	19.7	18.6	21.8	yes
Molybdenum	mg/kg	192	181.0	205.0	yes
Nickel	mg/kg	99.8	93.0	106.0	yes
Selenium	mg/kg	39.2	36.1	42.9	yes
Silver	mg/kg	19.8	17.99	22.01	yes
Thallium	mg/kg	9.84	9.57	11.23	yes
Tin	mg/kg	184	176.0	206.0	yes
Uranium	mg/kg	99.8	86.3	105.3	yes
Vanadium	mg/kg	18.7	17.0	20.4	yes
Zinc	mg/kg	204	180	220	yes
Date Acquired:	August 25, 2011				
Mercury	mg/kg	0.34	0.15	0.42	yes
Antimony	mg/kg	0.6	0.1	1.1	yes
Arsenic	mg/kg	89.1	70.1	97.5	yes
Barium	mg/kg	244	228	294	yes
Beryllium	mg/kg	0.9	0.5	1.1	yes
Cadmium	mg/kg	1.96	1.68	2.22	yes
Chromium	mg/kg	44.8	35.0	53.0	yes

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Quality Control

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Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Metals Strong Acid Digestion - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Cobalt	mg/kg	14.2	11.9	15.9	yes
Copper	mg/kg	195	155.7	225.9	yes
Lead	mg/kg	112	99.6	135.6	yes
Molybdenum	mg/kg	3	2.3	4.2	yes
Nickel	mg/kg	67.0	50.4	71.4	yes
Selenium	mg/kg	1.0	0.3	1.3	yes
Silver	mg/kg	1.0	0.42	1.32	yes
Thallium	mg/kg	0.34	0.29	0.43	yes
Tin	mg/kg	3	1.0	5.4	yes
Uranium	mg/kg	1.2	0.9	1.6	yes
Vanadium	mg/kg	48.2	40.2	54.0	yes
Zinc	mg/kg	488	360	550	yes

Date Acquired: August 25, 2011

Metals Total

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aluminum	mg/L	0.009	-0.01	0.02	yes
Calcium	mg/L	0.0132	-0.1	0.1	yes
Iron	mg/L	0.0067	-0.01	0.02	yes
Magnesium	mg/L	-0.0263	-0.0	0.0	yes
Manganese	mg/L	-0.0005	-0.003	0.003	yes
Potassium	mg/L	0.0239	-0.1	0.2	yes
Silicon	mg/L	0.012	-0.03	0.04	yes
Sodium	mg/L	0.0202	-0.1	0.2	yes
Sulfur	mg/L	0.0099	-0.1	0.2	yes
Mercury	ug/L	0.02	-0.0380	0.0700	yes
Antimony	ug/L	0.001	-0.2	0.2	yes
Arsenic	ug/L	-0.188	-0.2	0.2	yes
Barium	ug/L	0.09	-1	1	yes
Beryllium	ug/L	0.016	-0.1	0.1	yes
Bismuth	ug/L	-0.321	-0.5	0.5	yes
Boron	ug/L	0.782	-1	3	yes
Cadmium	ug/L	-0.006	-0.01	0.01	yes
Chromium	ug/L	0.063	-0.7	0.3	yes
Cobalt	ug/L	0.003	-0.1	0.1	yes
Copper	ug/L	-0.018	-1	1	yes
Lead	ug/L	-0.008	-0.1	0.1	yes
Lithium	ug/L	0.015	-1	1	yes
Molybdenum	ug/L	-0.06	-1	1	yes
Nickel	ug/L	-0.09	-0.5	0.5	yes
Selenium	ug/L	-0.098	-0.2	0.2	yes
Silver	ug/L	-0.0029	-0.02	0.10	yes

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Quality Control

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Metals Total - Continued

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Strontium	ug/L	0.109	-1	1	yes
Thallium	ug/L	-0.001	-0.05	0.05	yes
Tin	ug/L	0.264	-1	1	yes
Titanium	ug/L	0.023	-0.5	0.5	yes
Uranium	ug/L	-0.006	-0.5	0.5	yes
Vanadium	ug/L	0.0429	-0.1	0.1	yes
Zinc	ug/L	0.304	-0	1	yes
Zirconium	ug/L	<1	-1	1	yes
Date Acquired:	August 22, 2011				

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Aluminum	mg/L	13.5	14.8	15	0.03	yes
Calcium	mg/L	29.3	29.7	15	0.6	yes
Iron	mg/L	22.9	24.1	15	0.20	yes
Magnesium	mg/L	4.2	4.4	15	0.4	yes
Manganese	mg/L	0.409	0.417	15	0.010	yes
Potassium	mg/L	4.0	4.1	15	1.2	yes
Silicon	mg/L	20.1	19.0	15	0.10	yes
Sodium	mg/L	14.7	14.9	15	1.2	yes
Sulfur	mg/L	1.9	2.0	15	0.1	yes
Mercury	mg/L	<0.0001	<0.0001	10	0.0003	yes
Antimony	ug/L	<0.2	<0.2	15	0.4	yes
Arsenic	ug/L	0.3	0.2	15	0.4	yes
Barium	ug/L	14	14	15	2	yes
Beryllium	ug/L	<0.1	<0.1	15	0.2	yes
Bismuth	ug/L	<0.5	<0.5	15	1.1	yes
Boron	ug/L	918	980	15	4	yes
Cadmium	ug/L	<0.01	<0.01	15	0.02	yes
Chromium	ug/L	0.5	<0.5	15	1.1	yes
Cobalt	ug/L	<0.1	<0.1	15	0.2	yes
Copper	ug/L	2	2	15	2	yes
Lead	ug/L	0.6	0.6	15	0.2	yes
Lithium	ug/L	134	141	15	2	yes
Molybdenum	ug/L	<1	<1	15	2	yes
Nickel	ug/L	<0.5	<0.5	15	1.1	yes
Selenium	ug/L	0.8	0.4	15	0.4	yes
Silver	ug/L	<0.01	<0.01	15	0.22	yes
Strontium	ug/L	104	106	15	2	yes
Thallium	ug/L	<0.05	<0.05	15	0.11	yes
Tin	ug/L	<1	<1	15	2	yes
Titanium	ug/L	5.1	4.8	15	1.1	yes
Uranium	ug/L	<0.5	<0.5	15	1.1	yes
Vanadium	ug/L	0.3	0.3	15	0.2	yes

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Quality Control

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Metals Total - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Zinc	ug/L	17	17	15	2	yes
Date Acquired:	August 22, 2011					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aluminum	mg/L	3.90	3.60	4.40	yes
Calcium	mg/L	50.4	46.1	54.5	yes
Iron	mg/L	2.06	1.83	2.19	yes
Magnesium	mg/L	20.6	18.1	22.1	yes
Manganese	mg/L	0.494	0.465	0.565	yes
Potassium	mg/L	49.8	45.8	55.8	yes
Silicon	mg/L	1.98	1.81	2.21	yes
Sodium	mg/L	51.2	45.9	56.0	yes
Sulfur	mg/L	9.9	8.9	10.9	yes
Mercury	mg/L	0.0008	0.0006	0.0009	yes
Antimony	ug/L	11.1	9.7	12.7	yes
Arsenic	ug/L	10.9	9.6	12.6	yes
Barium	ug/L	60	54	68	yes
Beryllium	ug/L	5.6	4.7	6.6	yes
Bismuth	ug/L	28.8	24.8	34.4	yes
Boron	ug/L	118	102	139	yes
Cadmium	ug/L	0.54	0.47	0.78	yes
Chromium	ug/L	29.2	27.3	35.1	yes
Cobalt	ug/L	6.2	5.7	7.3	yes
Copper	ug/L	58	53	67	yes
Lead	ug/L	6.0	5.2	7.1	yes
Lithium	ug/L	63	53	77	yes
Molybdenum	ug/L	58	53	66	yes
Nickel	ug/L	28.9	26.2	35.2	yes
Selenium	ug/L	10	8.5	12.1	yes
Silver	ug/L	6.00	5.39	7.13	yes
Strontium	ug/L	60	54	69	yes
Thallium	ug/L	3.09	2.67	3.69	yes
Tin	ug/L	59	52	64	yes
Titanium	ug/L	29.0	26.6	35.7	yes
Uranium	ug/L	30.5	25.7	36.3	yes
Vanadium	ug/L	5.7	5.1	7.2	yes
Zinc	ug/L	56	49	67	yes
Zirconium	ug/L	62	56	68	yes
Date Acquired:	August 22, 2011				
Mercury	mg/L	0.0030	0.0026	0.0032	yes
Antimony	ug/L	40.3	36.8	42.6	yes
Arsenic	ug/L	43.5	37.7	44.7	yes
Barium	ug/L	201	184	209	yes

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Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Beryllium	ug/L	19.5	17.4	22.2	yes
Bismuth	ug/L	96.4	85.6	104.8	yes
Boron	ug/L	400	343	436	yes
Cadmium	ug/L	2.01	1.92	2.20	yes
Chromium	ug/L	100	92.2	105.8	yes
Cobalt	ug/L	21.2	19.2	22.6	yes
Copper	ug/L	200	176	207	yes
Lead	ug/L	20.6	18.6	21.8	yes
Lithium	ug/L	199	173	222	yes
Molybdenum	ug/L	191	181	205	yes
Nickel	ug/L	102	93.0	106.0	yes
Selenium	ug/L	40.6	36.1	42.9	yes
Silver	ug/L	21.0	19.69	22.11	yes
Strontium	ug/L	198	182	212	yes
Thallium	ug/L	10.6	9.57	11.23	yes
Tin	ug/L	194	176	206	yes
Titanium	ug/L	101	91.5	106.3	yes
Uranium	ug/L	96.5	86.3	105.3	yes
Vanadium	ug/L	19.0	17.0	20.4	yes
Zinc	ug/L	207	186	219	yes
Date Acquired:	August 22, 2011				
Mercury	mg/L	0.0008	0.0007	0.0009	yes
Antimony	ug/L	12.1	10.8	13.2	yes
Arsenic	ug/L	13.0	10.8	13.2	yes
Barium	ug/L	61	54	66	yes
Beryllium	ug/L	5.8	5.4	6.6	yes
Bismuth	ug/L	30.5	27.0	33.0	yes
Boron	ug/L	118	108	132	yes
Cadmium	ug/L	0.61	0.54	0.66	yes
Chromium	ug/L	29.1	27.0	33.0	yes
Cobalt	ug/L	6.2	5.4	6.6	yes
Copper	ug/L	60	54	66	yes
Lead	ug/L	6.2	5.4	6.6	yes
Lithium	ug/L	60	54	66	yes
Molybdenum	ug/L	59	54	66	yes
Nickel	ug/L	29.8	27.0	33.0	yes
Selenium	ug/L	11.8	10.8	13.2	yes
Silver	ug/L	6.37	5.40	6.60	yes
Strontium	ug/L	62	54	66	yes
Thallium	ug/L	3.19	0.00	6.00	yes
Tin	ug/L	59	54	66	yes
Titanium	ug/L	29.0	27.0	33.0	yes

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Quality Control

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	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring
	Winnipeg, MB, Canada	Location:	
	R3R 1E6	LSD:	
Attn:	A Passalis	P.O.:	
Sampled By:		Acct code:	
Company:			

Lot ID:	**821266**
Control Number:	89707
Date Received:	Aug 19, 2011
Date Reported:	Aug 29, 2011
Report Number:	1462516

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Uranium	ug/L	30.8	27.0	33.0	yes
Vanadium	ug/L	5.6	5.4	6.6	yes
Zinc	ug/L	62	54	66	yes
Zirconium	ug/L	61	54	66	yes
Date Acquired:	August 22, 2011				
Antimony	ug/L	1.9	1.8	2.2	yes
Arsenic	ug/L	2.0	1.8	2.3	yes
Barium	ug/L	10	9	11	yes
Beryllium	ug/L	1	0.8	1.1	yes
Bismuth	ug/L	5.0	4.6	5.7	yes
Boron	ug/L	19	17	23	yes
Cadmium	ug/L	0.1	0.08	0.11	yes
Chromium	ug/L	4.8	4.6	5.4	yes
Cobalt	ug/L	1.0	0.9	1.1	yes
Copper	ug/L	10	9	11	yes
Lead	ug/L	1.0	0.9	1.1	yes
Lithium	ug/L	10	9	11	yes
Molybdenum	ug/L	10	9	11	yes
Nickel	ug/L	5.0	4.5	5.5	yes
Selenium	ug/L	1.8	1.6	2.2	yes
Silver	ug/L	1.04	0.97	1.13	yes
Strontium	ug/L	11	10	11	yes
Thallium	ug/L	0.52	0.48	0.57	yes
Tin	ug/L	10	9	11	yes
Titanium	ug/L	4.7	4.5	5.4	yes
Uranium	ug/L	5.2	4.7	5.7	yes
Vanadium	ug/L	0.9	0.9	1.2	yes
Zinc	ug/L	10	9	11	yes
Zirconium	ug/L	10	10	11	yes
Date Acquired:	August 22, 2011				
Aluminum	mg/L	19.7	17.99	22.01	yes
Calcium	mg/L	245	230.0	257.6	yes
Iron	mg/L	9.81	9.07	10.15	yes
Magnesium	mg/L	101	92.8	104.7	yes
Manganese	mg/L	2.38	2.260	2.560	yes
Potassium	mg/L	255	232.2	259.9	yes
Silicon	mg/L	9.76	9.35	10.43	yes
Sodium	mg/L	254	226.8	267.4	yes
Sulfur	mg/L	146	136.5	166.3	yes
Date Acquired:	August 22, 2011				
Aluminum	mg/L	3.90	3.60	4.40	yes
Calcium	mg/L	50.7	45.0	55.0	yes

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Quality Control

Bill To:	Sila Remediation Inc.	Project:	
Report To:	EGE	ID:	
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring
	Winnipeg, MB, Canada	Location:	
	R3R 1E6	LSD:	
Attn:	A Passalis	P.O.:	
Sampled By:		Acct code:	
Company:			

Lot ID:	**821266**
Control Number:	89707
Date Received:	Aug 19, 2011
Date Reported:	Aug 29, 2011
Report Number:	1462516

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Iron	mg/L	2.06	1.80	2.20	yes
Magnesium	mg/L	20.5	18.0	22.0	yes
Manganese	mg/L	0.501	0.449	0.551	yes
Potassium	mg/L	49.8	45.0	55.0	yes
Silicon	mg/L	2.01	1.80	2.20	yes
Sodium	mg/L	50.9	45.0	55.0	yes
Sulfur	mg/L	9.8	9.0	11.0	yes
Date Acquired:	August 22, 2011				
Aluminum	mg/L	0.41	0.36	0.44	yes
Calcium	mg/L	5.2	4.6	5.6	yes
Iron	mg/L	0.21	0.18	0.22	yes
Magnesium	mg/L	2.1	1.8	2.2	yes
Manganese	mg/L	0.052	0.046	0.056	yes
Potassium	mg/L	5.1	4.5	5.5	yes
Silicon	mg/L	0.21	0.18	0.22	yes
Sodium	mg/L	5.3	4.7	5.5	yes
Sulfur	mg/L	3.0	2.8	3.2	yes
Date Acquired:	August 22, 2011				

Mono-Aromatic Hydrocarbons - Soil

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	90.80	85	115	yes
Toluene	ng	91.60	85	115	yes
Ethylbenzene	ng	89.60	85	115	yes
Total Xylenes (m,p,o)	ng	91.33	85	115	yes
Styrene	ng	88.40	85	115	yes
Date Acquired:	August 19, 2011				

Mono-Aromatic Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Benzene	ng	0	-0.002	0.002	yes
Toluene	ng	0	-0.002	0.002	yes
Ethylbenzene	ng	0	-0.002	0.002	yes
Total Xylenes (m,p,o)	ng	0	-0.002	0.002	yes
Styrene	ng	0	-0.002	0.002	yes
Date Acquired:	August 22, 2011				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	88.80	85	115	yes
Toluene	ng	109.40	85	115	yes
Ethylbenzene	ng	97.40	85	115	yes

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Quality Control

Bill To: Sila Remediation Inc.
Report To: EGE
511 Pepperloaf Cres.
Winnipeg, MB, Canada
R3R 1E6
Attn: A Passalis
Sampled By:
Company:

Project:
ID:
Name: CAM-3 Landfill Monitoring
Location:
LSD:
P.O.:
Acct code:

Lot ID: **821266**
Control Number: 89707
Date Received: Aug 19, 2011
Date Reported: Aug 29, 2011
Report Number: 1462516

Mono-Aromatic Hydrocarbons - Water - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Total Xylenes (m,p,o)	ng	94.67	85	115	yes
Styrene	ng	89.60	85	115	yes

Date Acquired: August 22, 2011

Volatile Petroleum Hydrocarbons - Soil

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F1 C6-C10	ng	100.00	80	120	yes

Date Acquired: August 19, 2011

Volatile Petroleum Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F1 -BTEX	mg/L	<0.2	-0.30	0.30	yes
F1 C6-C10	mg/L	<0.2	-0.30	0.30	yes

Date Acquired: August 22, 2011

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F1 C6-C10	ng	95.00	80	120	yes

Date Acquired: August 22, 2011

Extractable Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	ug/mL	0	-10	10	yes
F3c C16-C34	ug/mL	0	-30	30	yes
F4c C34-C50	ug/mL	0	-20	20	yes
F4HTGCc C34-C50+	ug/mL	0	-20	20	yes

Date Acquired: August 19, 2011

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	ug/mL	97.32	85	115	yes
F3c C16-C34	ug/mL	97.15	85	115	yes
F4c C34-C50	ug/mL	94.28	85	115	yes
F4HTGCc C34-C50+	ug/mL	95.06	85	115	yes

Date Acquired: August 19, 2011

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
F2c C10-C16	mg/kg	95	85	20	0	yes
F3c C16-C34	mg/kg	121	107	20	0	yes
F4c C34-C50	mg/kg	130	133	20	0	yes
F4HTGCc C34-C50+	mg/kg	127	134	20	0	yes

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Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Extractable Petroleum Hydrocarbons - Soil - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Date Acquired:	August 19, 2011					

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	mg/kg	95	65	135	yes
F3c C16-C34	mg/kg	121	65	135	yes
F4c C34-C50	mg/kg	130	65	135	yes
F4HTGCc C34-C50+	mg/kg	127	65	135	yes
Date Acquired:	August 19, 2011				

Extractable Petroleum Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F2 C10-C16	ug/mL	0	-0.2	0.2	yes
F3 C16-C34	ug/mL	0	-0.2	0.2	yes
F3+ C34+	ug/mL	0	-0.2	0.2	yes
Date Acquired:	August 22, 2011				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2 C10-C16	ug/mL	95.71	85	115	yes
F3 C16-C34	ug/mL	101.14	85	115	yes
F3+ C34+	ug/mL	93.38	85	115	yes
Date Acquired:	August 22, 2011				

Polychlorinated Biphenyls - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aroclor 1016	ug/mL	0	-0.3	0.3	yes
Aroclor 1221	ug/mL	0	-0.3	0.3	yes
Aroclor 1232	ug/mL	0	-0.3	0.3	yes
Aroclor 1242	ug/mL	0	-0.3	0.3	yes
Aroclor 1248	ug/mL	0	-0.3	0.3	yes
Aroclor 1254	ug/mL	0	-0.3	0.3	yes
Aroclor 1260	ug/mL	0	-0.3	0.3	yes
Aroclor 1262	ug/mL	0	-0.3	0.3	yes
Aroclor 1268	ug/mL	0	-0.3	0.3	yes
Date Acquired:	August 23, 2011				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Aroclor 1260	ug/mL	90.00	70	130	yes
Date Acquired:	August 23, 2011				

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Polychlorinated Biphenyls - Soil - Surrogate

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Decachlorobiphenyl	%	105.882	10	190	yes
Date Acquired:	August 23, 2011				

Polychlorinated Biphenyls - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aroclor 1016	ug/mL	0	-0.3	0.3	yes
Aroclor 1221	ug/mL	0	-0.3	0.3	yes
Aroclor 1232	ug/mL	0	-0.3	0.3	yes
Aroclor 1242	ug/mL	0	-0.3	0.3	yes
Aroclor 1248	ug/mL	0	-0.3	0.3	yes
Aroclor 1254	ug/mL	0	-0.3	0.3	yes
Aroclor 1260	ug/mL	0	-0.3	0.3	yes
Aroclor 1262	ug/mL	0	-0.3	0.3	yes
Aroclor 1268	ug/mL	0	-0.3	0.3	yes
Date Acquired:	August 24, 2011				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Aroclor 1254	ug/mL	90.00	80	120	yes
Date Acquired:	August 24, 2011				

Polychlorinated Biphenyls - Water - Surrogate

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Decachlorobiphenyl	%	71.9577	10	190	yes
Date Acquired:	August 24, 2011				

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Methodology and Notes

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Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Boron in general soil	McKeague	*	Hot Water Soluble Boron - Azomethine -H Method, 4.61	25-Aug-11	Exova Edmonton
BTEX-CCME - Soil	CCME	*	Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	19-Aug-11	Exova Calgary
BTEX-CCME - Soil	US EPA	*	US EPA method, 8260B/5035	19-Aug-11	Exova Calgary
BTEX-CCME - Water	US EPA	*	US EPA method, 8260B/5030B	22-Aug-11	Exova Calgary
Mercury (Hot Block) in Soil	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	25-Aug-11	Exova Edmonton
Mercury (Total) in water	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	19-Aug-11	Exova Edmonton
Metals ICP-MS (Hot Block) in soil	SW-846	*	Acid Digestion of Sediments, Sludges, and Soils, EPA 3050B	25-Aug-11	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	*	Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.8	22-Aug-11	Exova Edmonton
Metals Trace (Total) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	22-Aug-11	Exova Edmonton
PCB - Soil	US EPA	*	Polychlorinated Biphenyls (PCBs) by Gas Chromatography, 8082A	23-Aug-11	Exova Calgary
PCB - Water	US EPA	*	Polychlorinated Biphenyls (PCBs) by Gas Chromatography, 8082A	24-Aug-11	Exova Calgary
TEH-CCME - Water	MMCA	*	Petroleum Hydrocarbons in water, A108.0	22-Aug-11	Exova Calgary
TEH-CCME-Soil (Shake)	CCME	*	Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	19-Aug-11	Exova Calgary

** Reference Method Modified*

References

Alta. Env. Method	Alberta Environment Method
APHA	Standard Methods for the Examination of Water and Wastewater
CCME	Canadian Council of Ministers of the Environment
McKeague	Manual on Soil Sampling and Methods of Analysis
SW-846	Test Methods for Evaluating Solid Waste
US EPA	US Environmental Protection Agency Test Methods

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Methodology and Notes

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Comments:

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Analytical Report

Bill To:	Sila Remediation Inc.	Project:		Lot ID:	**821266**
Report To:	EGE	ID:		Control Number:	89707
	511 Pepperloaf Cres.	Name:	CAM-3 Landfill Monitoring	Date Received:	Aug 19, 2011
	Winnipeg, MB, Canada	Location:		Date Reported:	Aug 29, 2011
	R3R 1E6	LSD:		Report Number:	1462516
Attn:	A Passalis	P.O.:			
Sampled By:		Acct code:			
Company:					

Petroleum Hydrocarbons in Soil

Batch Notes

1. The method used complies with the Reference Method for the Canada Wide Standards for Petroleum Hydrocarbons in Soil - Tier 1, April 2001, including Addendum 1, and is accredited for use in Exova.
2. Modifications of the method: See Notes and Methodology for nonconformances (if applicable).
3. Qualifications on results: See Notes and Methodology for nonconformances (if applicable).
4. Silica gel treatment is performed for fractions F2, F3, F4.
5. F1-BTEX: BTEX has been subtracted from the F1 fraction.
6. If analyzed, naphthalene has been subtracted from fraction F2 and selected PAHs have been subtracted from fraction F3.
7. F4HTGC is reported when more than 5% of the total carbon envelope elutes past C_{50}.
8. Exova does not routinely report Gravimetric Heavy Hydrocarbons (F4G or F4G-sg), F4HTGC through extended range high temperature GC is reported instead.
9. When both F4(C_{34}-C_{50}) and F4HTGC are reported, F4HTGC is the final F4 that is to be used for interpreting the CWS.
10. Quality criteria met for the batch: Data is reported in Quality Control Section of report (if requested).
    -nC_6 and nC_{10} response factors (RF) are within 30% of RF for toluene
    -nC_{10}, nC_{16} and nC_{34} RFs are within 10% of each other
    -nC_{50} RF is within 30% of the average RF for nC_{10}+nC_{16}+nC_{34}
    -linearity is within 15% for each of the calibrated carbon ranges
11. Batch data for analytical quality control are available on request.
12. Extraction and analysis holding times were met: See Notes and Methodology for nonconformances (if applicable).

Approved by:

Randy Neumann, BSc
General Manager

Bodycote TESTING GROUP

ACCUTEST LABORATORIES - A New Bodycote Cor

☐ 146 Colonnade Rd., Unit 8
Ottawa, ON K2E 7Y1
Ph: (613) 727-5692 Fax: (613) 727-5222

☐ 608 N
Kingston,
Ph: (613) 634-9307 Fax: (613) 634-9308

LOT: 821266 COC

ODY

ımon Parkway, Unit 8
L2V 4Y6
Ph: (905) 660-8887 Fax: (905) 680-4256

89707

LABORATORY USE ONLY
Report #: _____

Company Name: SILA REMEDIATION INC.	Address: 4495 WILFRID-HAMEL BLVD
Report Attention: J.P. PELLETIER	City/Prov: SUITE 200 QUEBEC CITY, QUEBEC. Postal Code:
Phone: 418 653 4422 Ext:	Project # CAM-3 LANDFILL MONITORING * Quotation #
* Waterworks Name:	* Waterworks Number:

☐ Fax Results to: _____

☑ E-mail Results to: apassalis@mts.net jppelletie@biogenie-env.com

☐ Copy of Results to: _____

Note that for drinking water samples, all exceedances will be reported where (and how) the applicable legislation requires.

Invoice to:
(if different from above)

_____

_____

SAMPLE ANALYSIS REQUIRED NBurstrom ATS124608451

⇦ Indicate: F=Filtered or P=Preserved

Sample ID	* Date/Time Collected	Sample Matrix i.e. Water, Soil, Paint	* Sample Type (see Codes below)	* MOE Reportable? Y = Yes N = No	# of Containers	** Service Required R=Rush S=Standard	TPH (F1-F3) CWS	METALS (TOTAL) Cu, Ni, Co, Cr	Cd, Pb, Zn, As, Hg	PCBs (TOTAL)	Criteria Required (i.e. Reg. 170, Reg. 153, CCME, PWQO etc.) Include sub-categories if appropriate	Laboratory Identification
C311-5WA	15/8/11	S			3	S	X	X		X		
15WB	"	S			3	S	X	X		X		
C311-13W	"	W			6	S	X	X		X		

Sample Type Codes for Drinking Water Systems: **RW** = Raw Water, **RWFC** = Raw Water For Consumption, **TW** = Treated Water at point of entry to distribution, **DW** = Distribution/Plumbing Water
"MOE Reportable" refers to the requirements under the SDWA for immediate reporting of results, which are indicators of adverse water quality, to the Owner/Operator, MOE, and MOH Medical Officer.

Sampled By: Q. Passalis	Date/Time: 16/8/11	Relinquished By:	Date/Time:	Comments	Cooler Temp (°C) on Receipt
Work Authorized By (signature):	Date/Time:	Received By Lab:	Date/Time:		15.3°C

*** Indicates a required field.** If not complete, analysis will proceed only on verification of missing information. A quotation number is required, if one was provided.
**** There may be surcharges applied to "Rush" service.** Please check with lab prior to submission of samples for rush analysis to confirm availability and pricing.

AFCOCR.2

Copies: White - Laboratory, Yellow - With Report, Pink - Sampler

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Confirmation of Service Request

Lot ID: **821266**
Number of Samples: 3
Printed Date: Aug 28, 2011

Please verify the following service request. If you have corrections or questions, please contact Client Services.

Main Contact:
Attn: A Passalis
EGE
511 Pepperloaf Cres.
Winnipeg, MB R3R 1E6
Phone: (204) 837-6473
Fax: (204) 837-6473

Primary Administrator
Attn: A Passalis
EGE
511 Pepperloaf Cres.
Winnipeg, MB R3R 1E6
Phone: (204) 837-6473
Fax: (204) 837-6473

Invoice Delivery To:
Attn: Accounts Payable
Sila Remediation Inc.
200,4495 Boul. Wilfrid-Hamel
Quebec City, QC G1P 2J7
Phone: (418) 653-4422
Fax: (418) 653-3583

Bill Paid by:
Attn: Accounts Payable
Sila Remediation Inc.
200,4495 Boul. Wilfrid-Hamel
Quebec City, QC G1P 2J7
Phone: (418) 653-4422
Fax: (418) 653-3583

Agreement Id	90921	**Well Name**	
Project Id		**Well Location**	
Project Name	CAM-3 Landfill Monitoring	**Field**	
Project Location		**Formation**	
Project Legal		**Elevation KB**	
PO#		**Elevation GR**	
Proj. Acct. Code		**Drilling License**	
Control Id	89707	**Sampled By**	
Report Due	Aug 29, 2011	**Sampling Company**	
Received Date	Aug 19, 2011	**Est. Disposal Date**	Sep 28, 2011

Service Information

Sample Id **1**
3798918

Date Sampled 08-15-2011
Priority Normal
Sample Description C311-5WA

Service		Service Name
05		Drying and Grinding
PCB2	**B**	PCBs in soil or sediments
TT44		CCME metals in soil
DISP		Disposal of Soil/Water Sample
CCMEC	**B**	CCME Petroleum Hydrocarbons in Soil by Cold Extraction

Sample Id **2**
3798921

Date Sampled 08-15-2011
Priority Normal
Sample Description C311-5WB

Service		Service Name
05		Drying and Grinding
PCB2	**B**	PCBs in soil or sediments
TT44		CCME metals in soil
DISP		Disposal of Soil/Water Sample
CCMEC	**B**	CCME Petroleum Hydrocarbons in Soil by Cold Extraction

Sample Id **3**
3798922

Date Sampled 08-15-2011
Priority Normal
Sample Description C311-13W

Service		Service Name
HG		Total Hg
TW22		Total metals - water
PCB3	**B**	PCBs in water
DISP		Disposal of Soil/Water Sample
CCMEW	**B**	CCME BTEX, F1,F2, F3 in water by GC/FID/MSD

Other Billable Services	**Service**	**Service Name**	**Quantity**

Sample Service Count

Service Name	Service Code	Service Quantity
CCME BTEX, F1,F2, F3 in water by GC/FID/MSD	CCMEW	1
CCME metals in soil	TT44	2

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Confirmation of Service Request

Lot ID: **821266**
Number of Samples: 3
Printed Date: Aug 28, 2011

Please verify the following service request. If you have corrections or questions, please contact Client Services.

CCME Petroleum Hydrocarbons in Soil by Cold Extraction	CCMEC	2
Disposal of Soil/Water Sample	DISP	3
Drying and Grinding	05	2
PCBs in soil or sediments	PCB2	2
PCBs in water	PCB3	1
Total Hg	HG	1
Total metals - water	TW22	1

Notes

If required for invoice approval, please sign and return to the address indicated at the top of the page.

(Signature) _____

Report Delivery Plan

Contact	Company	Address
JP Pelletiere	Sila Remediation Inc.	511 Pepperloaf Cres. Winnipeg, MB R3R 1E6 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: jppelletier@biogenie-env.com

Copies	Delivery	Format
1	Email - Merge Reports	PDF

Contact	Company	Address
A Passalis	EGE	511 Pepperloaf Cres. Winnipeg, MB R3R 1E6 Phone: (204) 837-6473 Fax: (204) 837-6473 Email: apassalis@mts.net

Copies	Delivery	Format
1	Email - Merge Reports	PDF